

**Utah Department of Transportation**



**Supplemental Drawings  
for**

**2005 Standard  
Specifications**

**FOR ROAD AND BRIDGE  
CONSTRUCTION**

**U.S. Standard Units (Inch-Pound Units)**

**Issued May 10, 2007**

# Memorandum

UTAH DEPARTMENT OF TRANSPORTATION

**DATE:** May 10, 2007

**TO:** Holders of Hard Copy of Standard Drawings

**FROM:** Barry Axelrod, CDT  
Standards and Specifications

**SUBJECT:** Supplemental Drawing Distribution, dated May 10, 2007

Applicable files for the change are attached. Maintain these files as a supplemental update to the UDOT Standard Drawings dated February 1, 2007. No pages are to be removed or replaced in the basic book, electronic or hard copy.

If you are in need of electronic copies of any Standard or Supplemental Drawing please refer to the Standards and Specifications Web site at <http://www.udot.utah.gov/main/f?p=100:pg:12632538475555658704:::V,T::,302>. From there select the **2005 Standards** subtopic.

Please note that the 2005 Standards are still in effect. The next version of the Standards is planned for 2008.

If you have any questions or problems with the electronic files contact me at 801-964-4570 or by email at [baxelrod@utah.gov](mailto:baxelrod@utah.gov).

Attachments

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UTAH DEPARTMENT OF TRANSPORTATION

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DD 15A1	Typical Rural 2 Lane Road Intersection (High Speed)	<b>04/26/07</b>
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PV 3	Concrete Pavement Details For Urban And Interstate	01/01/05
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PV 5	Urban Concrete Pavement Details	01/01/05
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PV 7	Rumble Strips - Typical Application	02/22/07
PV 8	Rumble Strips Centerline Application	<b>04/26/07</b>
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SL 11	Traffic Signal Loop Detector Details	02/23/06
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SL 14	Highway Luminaire Pole Ground Mount	08/25/05
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SN 2	School Speed Limit Assembly	01/01/05
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SN 7	Placement of Ground Mounted Signs	01/01/05
SN 8	Ground Mounted Timber Sign Post (P1)	04/28/05
SN 9	Ground Mounted Tubular Steel Sign Post (P2)	02/22/07
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ST 2	Freeway Crossover Markings	01/01/05
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ST 4	Crosswalks, Parking And Intersection Approaches	02/22/07
ST 5	Painted Median And Auxiliary Lane Details	02/23/06
ST 6	Passing/Climbing Lanes Traffic Control	01/01/05
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### **Traffic Control (TC)**

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TC 1B	Construction Zone Signing	<b>04/26/07</b>
TC 1C	Work Zone Advanced Warning Arrow Panels	<b>04/26/07</b>
TC 1D	Delineator Mounted Work Zone Sign Bracket	<b>04/26/07</b>
TC 2A	Hazard Mitigation	<b>04/26/07</b>
TC 2B	Traffic Control Drawing Series General Notes	<b>04/26/07</b>
TC 3A	Standard Work Zone Signing General	<b>04/26/07</b>
TC 3B	Reduced Speed Work Zone Signing General	<b>04/26/07</b>
TC 3C	Traffic Control Project Limit Signing	<b>04/26/07</b>
TC 3D	Work Zone Specialty Signs	<b>04/26/07</b>
TC 4	Traffic Control Urban Intersections With Roadways Under 50 MPH	01/01/05
TC 5	Traffic Control Urban Intersections With Roadways Under 50 MPH	01/01/05
TC 6	Traffic Control Pedestrian Routing	01/01/05
TC 7	Traffic Control Road Closed, Detour	01/01/05
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TC 9	Traffic Control Multilane Closure	01/01/05
TC 10	Traffic Control Expressway And Freeway Crossover/Turn Around	01/01/05
TC 11	Traffic Control Exit Ramp Gore	06/29/06
TC 12	Traffic Control Entrance Ramp Gore	01/01/05
TC 13	Traffic Control Shoulder-Haul Road	01/01/05
TC 14	Traffic Control Flagging Operation	01/01/05
TC 15	Traffic Control 2 Lane/2 Way Seal Coat With Cover Material	01/01/05
TC 16	Traffic Control Pavement Marking	01/01/05

## **Listing of Supplemental Drawings**

### **Issue Date: March 8, 2007**

Revised February 22, 2007

AT 2	Ramp Meter Details
AT 3	Deleted (Replaced by AT 3A and AT 3B)
AT 3A	Ramp Meter Sign Panel
AT 3B	Ramp Meter Sign Panel
AT 4	Typical Ramp Meter Signal Head Mounting
AT 5	Ramp Meter Loop Installation
AT 6	Conduit Details
AT 7	Polymer-Concrete Junction Box Details
AT 8	ATMS Cabinet
AT 9	ATMS Cabinet Disconnect And Transformer Frame
AT 15	RWIS Site And Foundation Details
AT 16	RWIS Tower Base And Service Pad Layout
AT 17	Ground Rod Installation And Tower Grounding
AT 18	TMS Detection Zone Layout
BA 1E	Precast Concrete Full Section Shoulder Applications
BA 4C	W-Beam Guardrail Transition Curb Section
GW 8	Newspaper And Mailbox Support Hardware
PV 6	Rumble Strips
PV 7	Rumble Strips - Typical Application
PV 9	Dowel Bar Retrofit
SL 9	Pedestrian Signal Assembly
SN 9	Ground Mounted Tubular Steel Sign Post (P2)
ST 3	Typical Pavement Markings
ST 4	Crosswalks, Parking And Intersection Approaches

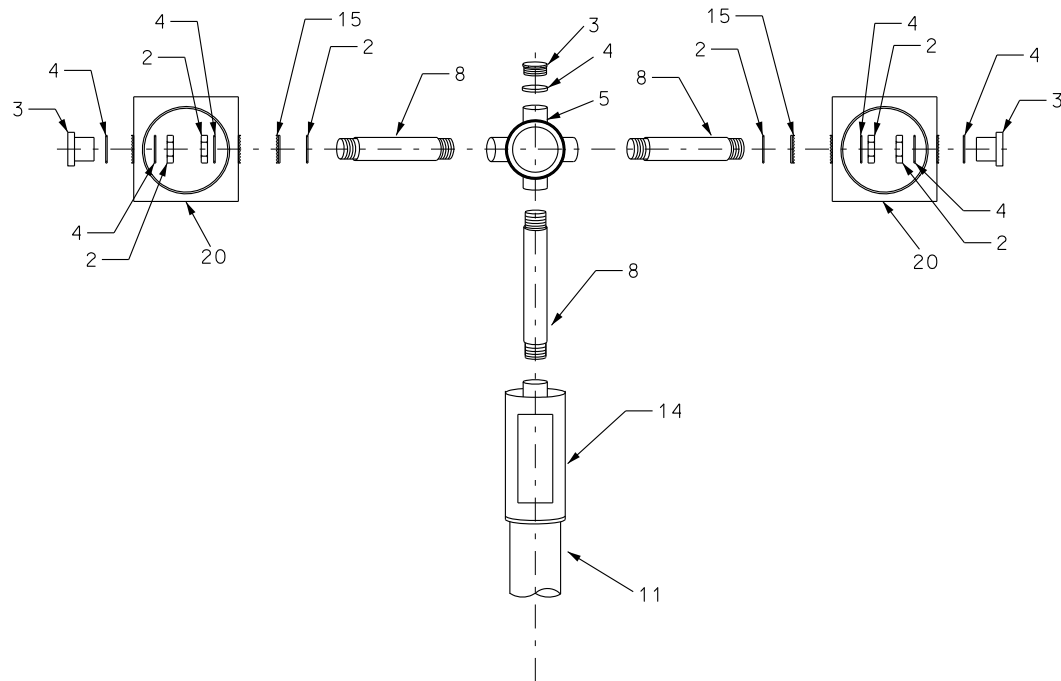
### **Issue Date: May 10, 2007**

Revised April 26, 2007

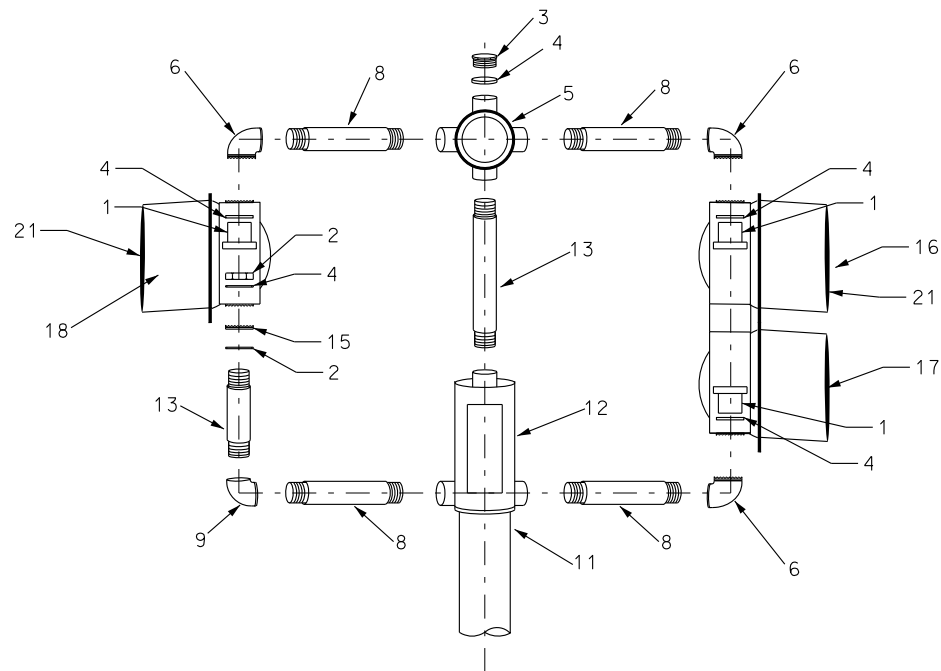
AT 4	Typical Ramp Meter Signal Head Mounting
AT 8	ATMS Cabinet
CC 4	Details for Placement Crash Cushions Type A, B, and D
DD 14	Deleted (Replaced by DD 14A)
DD 14A	Typical Rural 2 Lane Road 'Tee' Intersection (High Speed)
DD 14B	Typical Rural 2 Lane Road 'Tee' Intersection (Low Speed)
DD 15A1	Typical Rural 2 Lane Road Intersection (High Speed)
DD 15A2	Typical Rural 2 Lane Road Intersection (High Speed) With Left Turn Acceleration Lane
DD 15B	Typical Rural 2 Lane Road Intersection (Low Speed)

DD 16	Embankment for Bridge Placement
GW 5A	Pedestrian Access
GW 5B	Pedestrian Access
GW 5C	Pedestrian Access
PV 8	Rumble Strips Centerline Application
TC 1A	Construction Zone Channelization Devices
TC 1B	Construction Zone Signing
TC 1C	Work Zone Advanced Warning Arrow Panels
TC 1D	Delineator Mounted Work Zone Sign Bracket
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TC 3	Deleted (Replaced by TC 3A - TC 3D)
TC 3A	Standard Work Zone Signing General
TC 3B	Reduced Speed Work Zone Signing General
TC 3C	Traffic Control Project Limit Signing
TC 3D	Work Zone Specialty Signs

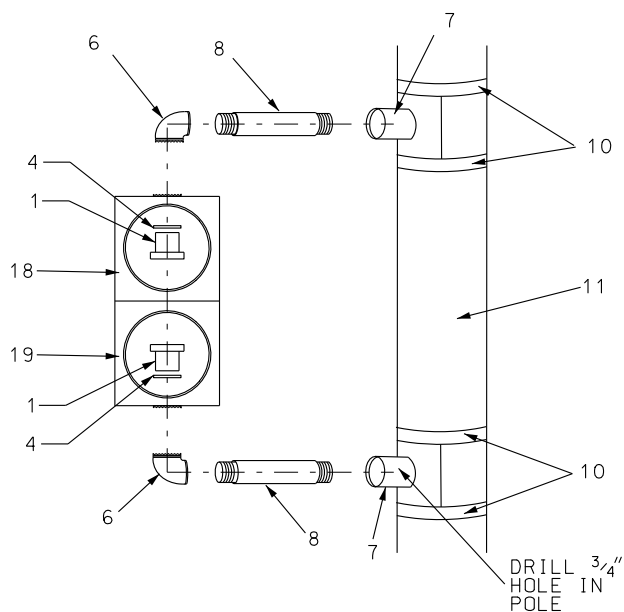
08-MAY-2007 DGN File: L:\Standard Drawings\Imperial\2005\approved\Supplemental Issues\Supp2\approved\at04.dgn



**A**  
**AT 4** ADVANCE FLASHING BEACON  
SIGNAL HEAD MOUNTING DETAILS



**B**  
**AT 4** TOP SIGNAL HEAD MOUNTING DETAILS  
WITH ENFORCEMENT INDICATION



**C**  
**AT 4** SIDE SIGNAL HEAD MOUNTING DETAILS  
(SEE NOTE 1)

DETAIL LEGEND:



1. LOCK NIPPLE, BRASS,  $1\frac{1}{2}'' \times 1\frac{3}{4}''$
2. LOCK NUT, BRASS,  $1\frac{1}{2}''$
3. CAP, ORNAMENTAL, LONG, BRASS,  $1\frac{1}{2}'' \times 1\frac{3}{4}''$
4. WASHER, STAINLESS STEEL
5. HUB, CENTER W/COVER PLATE 4-WAY, BRASS
6. ELBOW, 90°, GALVANIZED, THREADED INSIDE,  $1\frac{1}{2}''$  SERRATED
7. ROUND POLE PLATE, GALVANIZED
8. PIPE, GALVANIZED, THREADED BOTH ENDS,  $1\frac{1}{2}'' \times 12''$
9. ELBOW, 90°, GALVANIZED, THREADED INSIDE,  $1\frac{1}{2}''$
10. BANDS, STAINLESS STEEL,  $\frac{3}{4}''$
11. POLE SHAFT
12. POST TOP TERMINAL COMPARTMENT, 2 WAY, BRASS, WITH NO TERMINAL BLOCK
13. PIPE, GALVANIZED, LENGTH VARIABLE, THREADED BOTH ENDS,  $1\frac{1}{2}''$
14. POST TOP TERMINAL COMPARTMENT, BRASS, WITH NO TERMINAL BLOCK

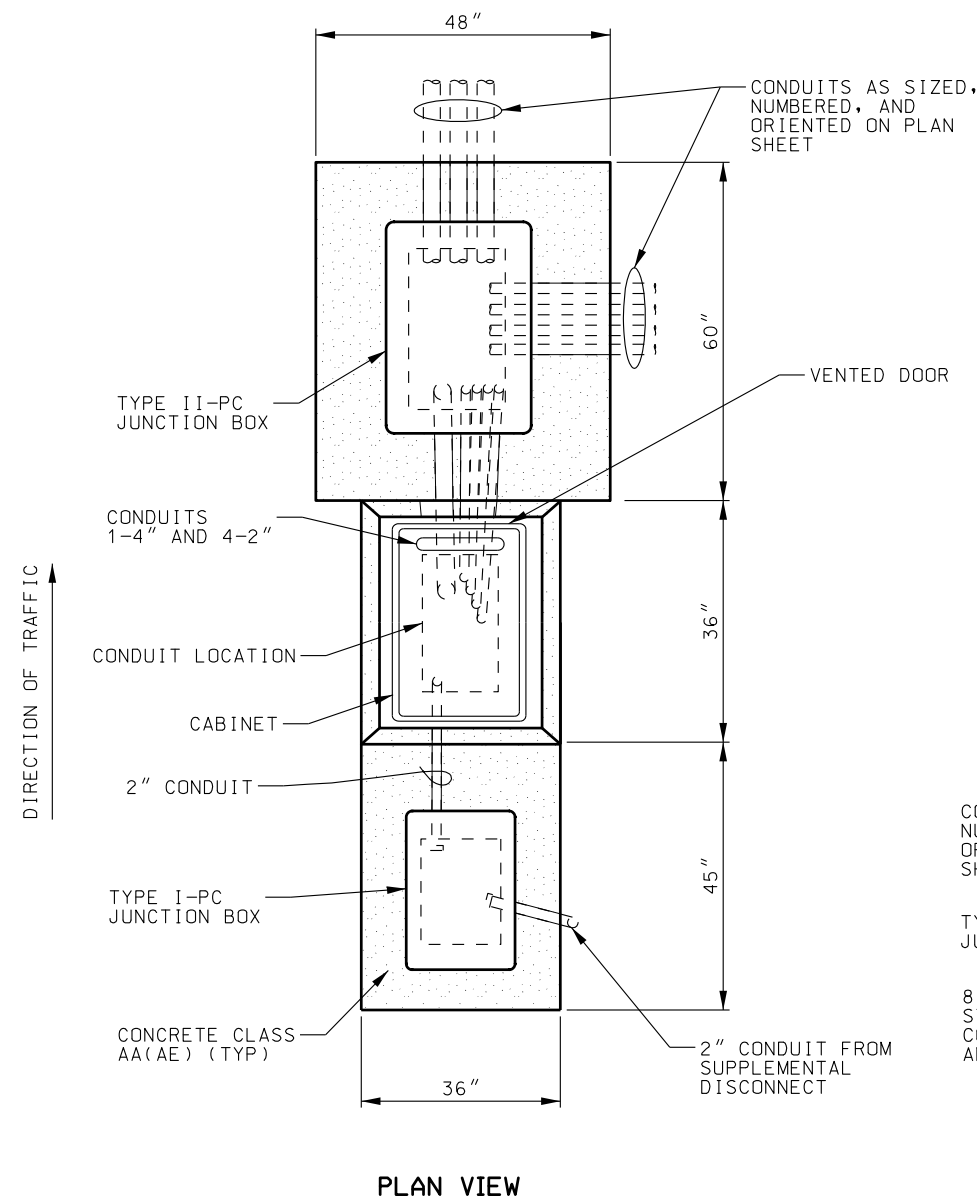
15. WASHER, SERRATED,  $1\frac{1}{2}''$
16. SIGNAL HEAD - RED LED, 12"
17. SIGNAL HEAD - GREEN LED, 12"
18. SIGNAL HEAD - RED LED, 8"
19. SIGNAL HEAD - GREEN LED, 8"
20. SIGNAL HEAD - AMBER LED, 8"
21. VISOR - 8" AND 12"

NOTE:

1. USE SIDE SIGNAL HEAD ONLY ON SINGLE LANE RAMPS.

SUPPLEMENTAL DRAWING

TYPICAL RAMP METER SIGNAL HEAD MOUNTING		UTAH DEPARTMENT OF TRANSPORTATION STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION SIGNAL HEAD MOUNTING		REVISIONS					
STD DWG AT 4		RECOMMENDED FOR APPROVAL  CHAIRMAN STANDARDS COMMITTEE APPROVED  DEPUTY DIRECTOR		1	04/28/05	S.S.	UPDATED AND REARRANGED DETAILS.		
				2	6/21/06	TJM	ADDED VISOR AND DELETED POWDER NOTE.		
				3	02/22/07	TJM	ADDED #21 TO DETAIL LEGEND AND CALLOUT IN DETAIL B.		
				4	04/26/07	TJM	CORRECTED DETAIL AT 4B FOR REVERSED NUMBERS.		
STANDARD DRAWING TITLE		APR.26.2007 DATE		NO.			DATE	APPR.	REMARKS



ATMS CABINET

## ATMS CABINET

STANDARD DRAWING TITLE

REMARKS

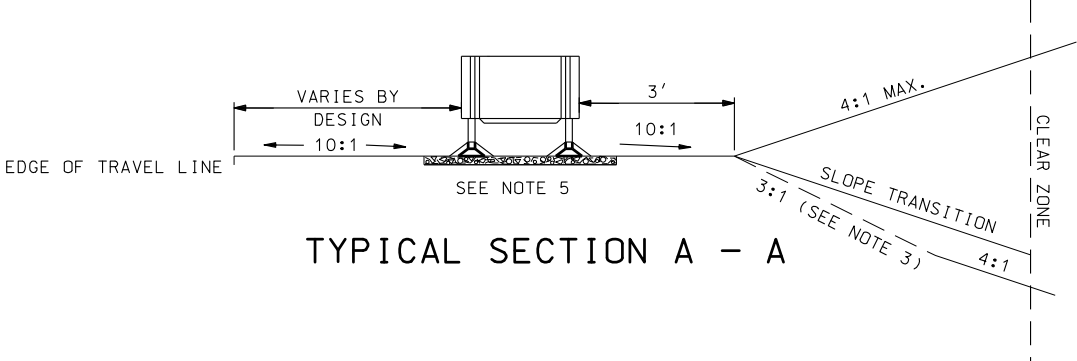
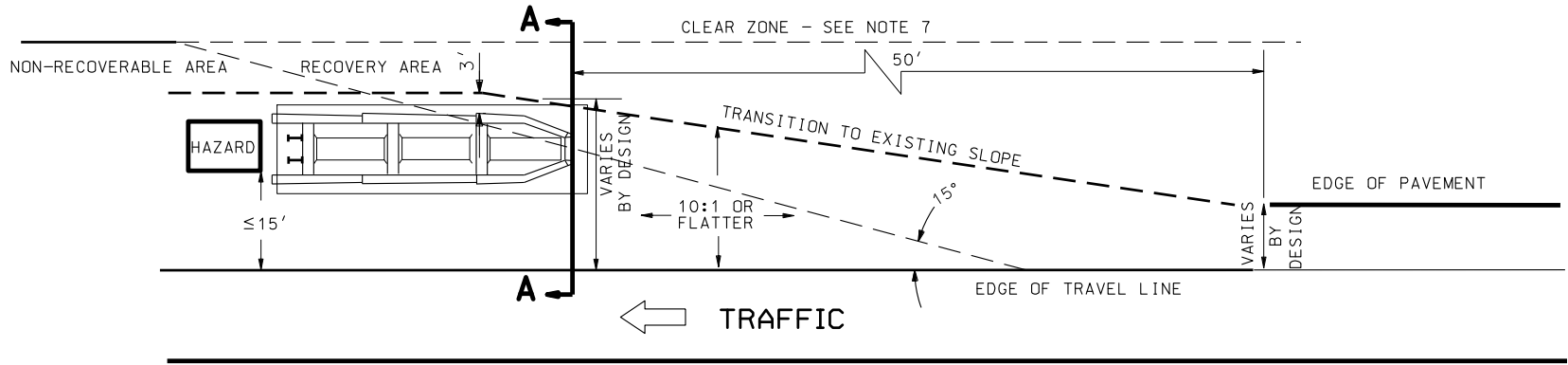
UTAH DEPARTMENT OF TRANSPORTATION  
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

REVISIONS			
1	02/24/05	S.S.	ENTIRE DRAWING REVISED, TITLE CHANGED.
2	02/22/07	TJM	ADDED NOTE 2 AND 3, CHANGED PLAN VIEW, MODIFIED SIDE ELEVATION DETAIL.
3	04/26/07	TJM	ADDED MISSING JUNCTION BOX DETAIL.
NO.	DATE	APPR.	REMARKS

DATE \_\_\_\_\_  
HFN.20,2007APR.26.2007  
DATE

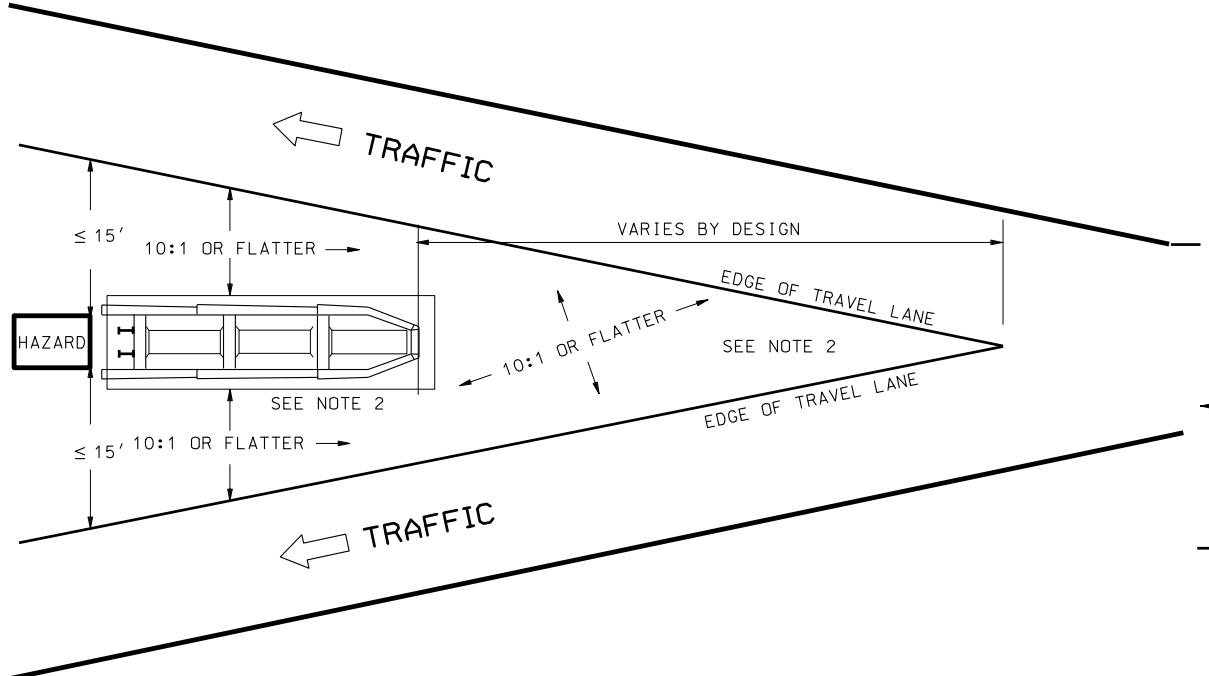
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SHOULDER APPLICATION

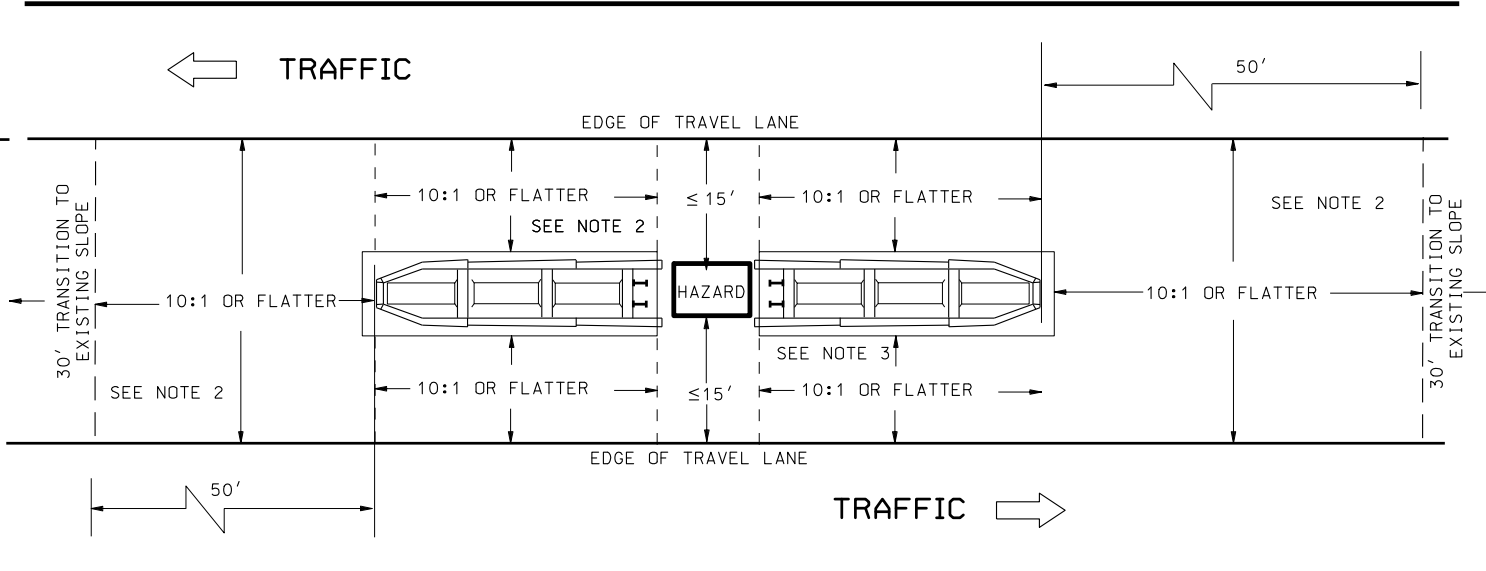


TYPICAL SECTION A - A

GORE APPLICATION AREA



MEDIAN APPLICATION



NOTES:

1. CRASH CUSHION TYPE A: QUADGUARD, MANUFACTURED BY ENERGY ABSORPTION SYSTEMS, TO PROTECT HAZARDS FROM 37 INCHES TO 90 INCHES.  
  
CRASH CUSHION TYPE B: QUADGUARD, MANUFACTURED BY ENERGY ABSORPTION SYSTEMS, TO PROTECT HAZARDS UP TO 36 INCHES.  
  
CRASH CUSHION TYPE D: QUADGUARD ELITE AND QUADGUARD LMC, MANUFACTURED BY ENERGY ABSORPTION SYSTEMS, AND REACT 350, MANUFACTURED BY ROADWAY SAFETY SERVICES.  
TYPE D SYSTEMS PROTECT HAZARDS UP TO 90 INCHES IN WIDTH. TYPE D SYSTEMS ARE USED WHERE ONE OR MORE IMPACTS PER YEAR ARE ANTICIPATED, OR WHEN REPAIR HISTORY INDICATES TWO OR MORE IMPACTS OVER A THREE YEAR PERIOD.
2. ALL APPLICATIONS REQUIRE THE USE OF A 10:1 SLOPE OR FLATTER TO THE FRONT AND SIDE APPROACHES. USE A 10:1 OR FLATTER SLOPE AT THE REAR OF THE SYSTEM WHEN TRAFFIC ALSO APPROACHES FROM THE REAR OF THE SYSTEM.
3. USE A 4:1 OR FLATTER FILL SLOPE AND A RECOVERY AREA IF IMPRACTICAL, USE A MAXIMUM 3:1 FILL SLOPE AND A RECOVERY AREA ESTABLISHED AT THE TOE OF 3:1 FILL SLOPE. WHEN USED WITH A CUT SLOPE, A 4:1 OR FLATTER CUT IS REQUIRED IN THE RECOVERY AREA.
4. USE A TRANSITION ELEMENT, AS PER MANUFACTURER'S SPECIFICATIONS, WHEN TRAFFIC APPROACHES THE REAR OF SYSTEM.
5. USE MANUFACTURER'S SPECIFICATIONS FOR PAD AND BACKUP REQUIREMENTS.
6. INSTALL PROPER MARKINGS AS PER STD DWG CC 1.
7. MAINTAIN AASHTO CLEAR ZONE REQUIREMENTS.

REVISIONS		UTAH DEPARTMENT OF TRANSPORTATION		DETAILS FOR PLACEMENT CRASH CUSHIONS TYPE A, B, AND D	
NO.	DATE	APPROVED	REMARKS	STANDARD DRAWING TITLE	STD DWG
1	04/26/07	RM	CORRECTED SLOPE CALLOUT IN NOTE 2.	STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION	CC 4
				RECOMMENDED FOR APPROVAL	
				CHAIRMAN STANDARDS COMMITTEE	
				DEPUTY DIRECTOR	
				APR. 26, 2007	
				DATE	
				APR. 26, 2007	
				DATE	

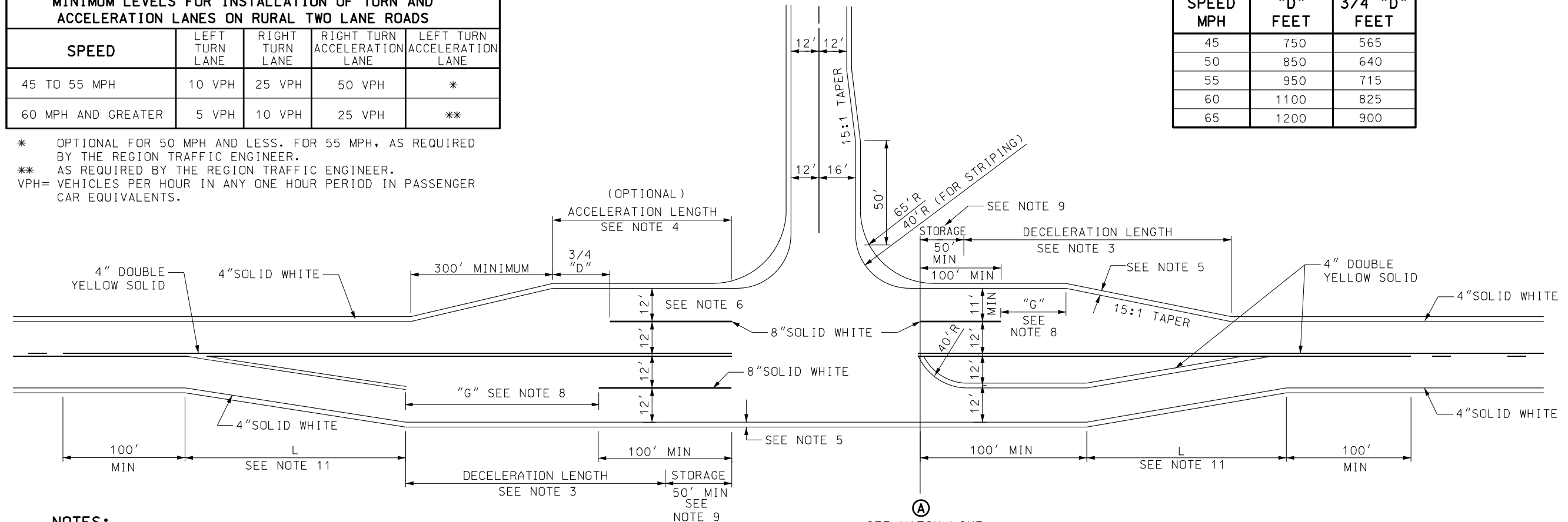
TABLE I				
MINIMUM LEVELS FOR INSTALLATION OF TURN AND ACCELERATION LANES ON RURAL TWO LANE ROADS				
SPEED	LEFT TURN LANE	RIGHT TURN LANE	RIGHT TURN ACCELERATION LANE	LEFT TURN ACCELERATION LANE
45 TO 55 MPH	10 VPH	25 VPH	50 VPH	*
60 MPH AND GREATER	5 VPH	10 VPH	25 VPH	**

\* OPTIONAL FOR 50 MPH AND LESS. FOR 55 MPH, AS REQUIRED BY THE REGION TRAFFIC ENGINEER.

\*\* AS REQUIRED BY THE REGION TRAFFIC ENGINEER.

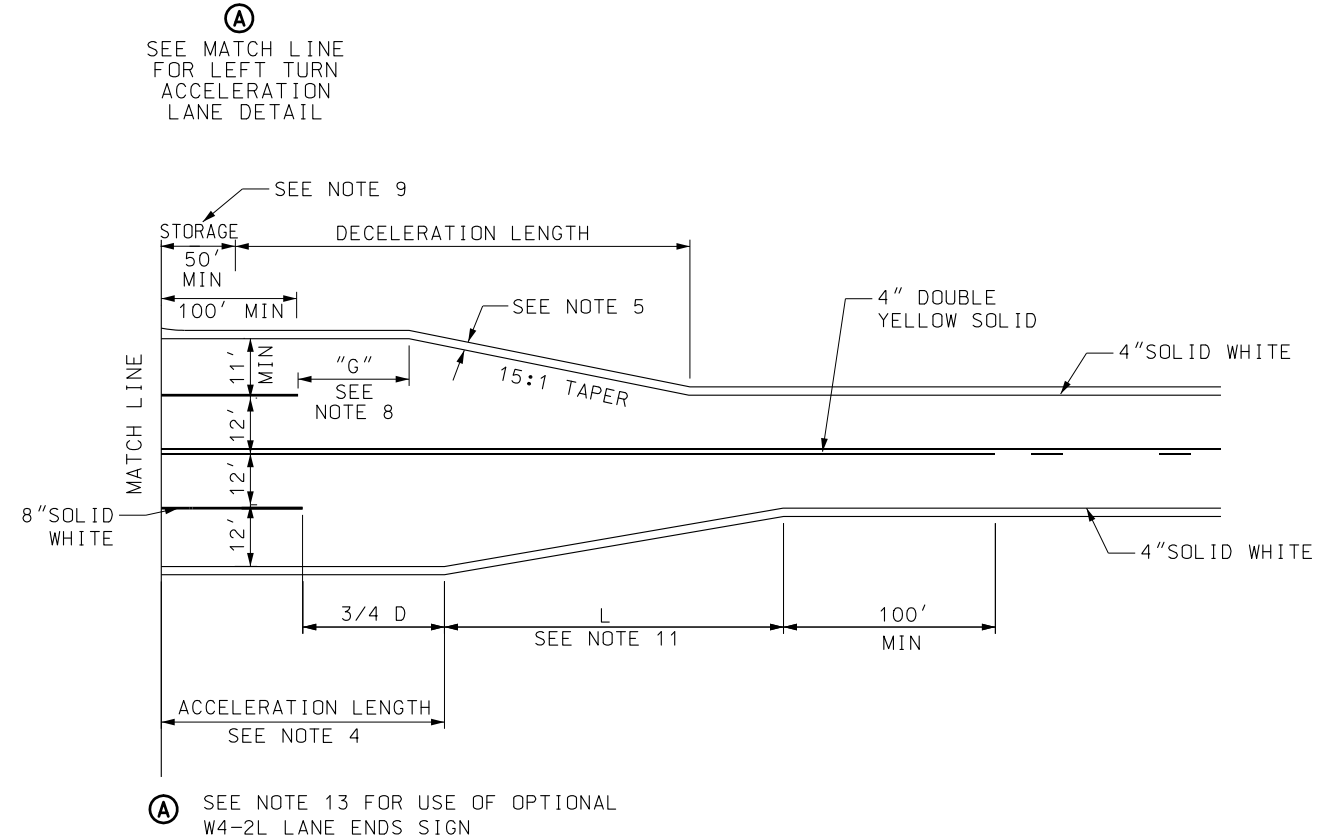
VPH= VEHICLES PER HOUR IN ANY ONE HOUR PERIOD IN PASSENGER CAR EQUIVALENTS.

"D" DISTANCE		
SPEED MPH	"D" FEET	3/4 "D" FEET
45	750	565
50	850	640
55	950	715
60	1100	825
65	1200	900



NOTES:

1. USE CURRENT EDITION OF THE AASHTO A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS FOR DESIGN OF ROADWAY ELEMENTS NOT SHOWN ON THIS STD DWG.
2. USE CURRENT EDITION OF THE AASHTO ROADSIDE DESIGN GUIDE FOR CLEAR ZONE REQUIREMENTS NOT SHOWN ON THIS STD DWG.
3. FOR DECELERATION LENGTH:  
RIGHT TURN - USE THE POSTED SPEED LIMIT AS THE DESIGN SPEED AND AN AVERAGE RUNNING SPEED OF 14 MPH.  
LEFT TURN - USE THE POSTED SPEED LIMIT AS THE DESIGN SPEED AND AN AVERAGE RUNNING SPEED OF A STOP CONDITION.  
ADJUST FOR SPEED CHANGES ON GRADES AS NECESSARY.
4. FOR ACCELERATION LENGTH:  
USE AN INITIAL RUNNING SPEED OF 14 MPH AND USE THE POSTED SPEED LIMIT AS THE DESIGN SPEED.  
ADJUST FOR SPEED CHANGES ON GRADES AS NECESSARY.
5. USE 4 FEET MINIMUM SHOULDER FOR RIGHT TURN DECELERATION LANE TAPER, RIGHT TURN STORAGE LANE, RIGHT TURN ACCELERATION LANE, AND RIGHT TURN ACCELERATION LANE TAPER. MATCH EXISTING WIDTH OF SHOULDER, WITH A 4 FEET MINIMUM, AT ALL OTHER SHOULDER LOCATIONS.
6. USE A 16 FEET MINIMUM ACCEPTANCE LANE FOR 50 FEET WITH A 15:1 TAPER IF RIGHT TURN ACCELERATION LANE IS NOT USED.
7. STANDARDS SHOWN ARE RECOMMENDED VALUES. EXCEED STANDARDS IF CONDITIONS PERMIT.
8.  $G = 140'$  FOR SPEEDS 45 TO 50 MPH  
 $G = 180'$  FOR SPEEDS 55 MPH AND ABOVE
9. INCREASE VEHICLE STORAGE LENGTH AS DETERMINED BY ENGINEERING STUDY OR REGION TRAFFIC ENGINEER.
10. SEE STD DWG ST 5 FOR INFORMATION ON STRIPING DETAILS.
11. FOR POSTED SPEED  $\geq 45$  MPH  $L = WS$   
 $L$  = TAPER LENGTH IN FEET  
 $W$  = WIDTH OF OFFSET IN FEET  
 $S$  = SPEED IN MPH
12. PROVIDE A TWO WAY LEFT TURN LANE CONNECTING ADJACENT ACCESS POINTS WHEN THEIR TAPERS OVERLAP, OR AS REQUIRED BY THE REGION TRAFFIC ENGINEER.
13. OPTIONAL USE OF W4-2L, LEFT LANE ENDS SIGN, AT A DISTANCE "D" UPSTREAM FROM THE BEGINNING OF THE TAPER.



## LEFT TURN ACCELERATION DETAIL

**SUPPLEMENTAL DRAWING**

<p>STD DWG</p> <p>DD 14A</p>	<p>TYPICAL RURAL 2 LANE ROAD "TEE" INTERSECTION (HIGH SPEED)</p>	<p>STANDARD DRAWING TITLE</p>	<p>UTAH DEPARTMENT OF TRANSPORTATION</p> <p>STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION</p> <p>SALT LAKE COUNTY</p> <p>RECOMMENDED FOR APPROVAL</p> <p>APR. 26, 2007</p> <p>DATE</p> <p>CHAIRMAN STANDARDS COMMITTEE</p> <p>APPROVED</p> <p>APR. 26, 2007</p> <p>DATE</p> <p>DEPUTY DIRECTOR</p>	<p>NO.</p> <p>DATE</p> <p>APPR.</p> <p>REMARKS</p>
			<p>1 04/26/07 JL NEW DRAWING. REPLACED DD 14.</p>	<p>REVISIONS</p>



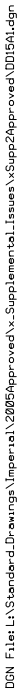
1. USE CURRENT EDITION OF THE AASHTO A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS FOR DESIGN OF ROADWAY ELEMENTS NOT SHOWN ON THIS STD DWG.
2. USE CURRENT EDITION OF THE AASHTO ROADSIDE DESIGN GUIDE FOR CLEAR ZONE REQUIREMENTS NOT SHOWN ON THIS STD DWG.
3. USE 4 FEET MINIMUM SHOULDER FOR RIGHT TURN DECELERATION LANE TAPER AND RIGHT TURN STORAGE LANE. MATCH EXISTING WIDTH OF SHOULDER, WITH A 4 FEET MINIMUM, AT ALL OTHER SHOULDER LOCATIONS.
4. STANDARDS SHOWN ARE RECOMMENDED VALUES. EXCEED STANDARDS IF CONDITIONS PERMIT.
5. USE STD DWG DD 14A FOR RIGHT TURN AND/OR LEFT TURN ACCELERATION LANES IF REQUIRED. USE "D" VALUES IN THIS STD DWG FOR DESIGN.
6. USE A 16 FEET MINIMUM ACCEPTANCE LANE FOR 50 FEET WITH A 15:1 TAPER WHEN RIGHT TURN ACCELERATION LANE IS NOT USED.
7. 12' LANE WIDTH DESIRABLE  
10' MINIMUM LOW VOLUME.
8. SEE STD DWG ST 5 FOR INFORMATION ON STRIPING DETAILS.
9. FOR POSTED SPEED  $\leq 40$  MPH, USE  $L = \frac{WS^2}{60}$   
L = TAPER LENGTH IN FEET  
W = WIDTH OF OFFSET IN FEET  
S = SPEED IN MPH
10. PROVIDE A TWO WAY LEFT TURN LANE CONNECTING ADJACENT ACCESS POINTS WHEN THEIR TAPERS OVERLAP, OR AS REQUIRED BY THE REGION TRAFFIC ENGINEER.
11. INCREASE VEHICLE STORAGE LENGTH AS DETERMINED BY ENGINEERING STUDY OR REGION TRAFFIC ENGINEER.

VPH= VEHICLES PER HOUR IN ANY ONE HOUR PERIOD IN PASSENGER  
CAR EQUIVALENTS.  
\* SEE NOTE 5.

SUPPLEMENTAL DRAWING

STANDARD	DRAWING	TITLE
ASME Y14.1	1	GENERAL PRINCIPLES OF FIRST ANGLE PROJECTION
ASME Y14.2	2	GENERAL PRINCIPLES OF DIMENSIONING
ASME Y14.3	3	GENERAL PRINCIPLES OF TOLERANCES
ASME Y14.4	4	GENERAL PRINCIPLES OF SURFACE FINISH
ASME Y14.5	5	GENERAL PRINCIPLES OF MATERIAL SPECIFICATIONS
ASME Y14.6	6	GENERAL PRINCIPLES OF MANUFACTURING METHODS
ASME Y14.7	7	GENERAL PRINCIPLES OF ASSEMBLY DRAWINGS
ASME Y14.8	8	GENERAL PRINCIPLES OF ELECTRICAL DRAWINGS
ASME Y14.9	9	GENERAL PRINCIPLES OF PNEUMATIC AND HYDRAULIC DRAWINGS
ASME Y14.10	10	GENERAL PRINCIPLES OF MECHANICAL DRAWINGS
ASME Y14.11	11	GENERAL PRINCIPLES OF ARCHITECTURAL DRAWINGS
ASME Y14.12	12	GENERAL PRINCIPLES OF CIVIL ENGINEERING DRAWINGS
ASME Y14.13	13	GENERAL PRINCIPLES OF CHEMICAL ENGINEERING DRAWINGS
ASME Y14.14	14	GENERAL PRINCIPLES OF METALLURGICAL DRAWINGS
ASME Y14.15	15	GENERAL PRINCIPLES OF AERONAUTICAL DRAWINGS
ASME Y14.16	16	GENERAL PRINCIPLES OF MARINE ENGINEERING DRAWINGS
ASME Y14.17	17	GENERAL PRINCIPLES OF AGRICULTURAL ENGINEERING DRAWINGS
ASME Y14.18	18	GENERAL PRINCIPLES OF MINING ENGINEERING DRAWINGS
ASME Y14.19	19	GENERAL PRINCIPLES OF INDUSTRIAL ENGINEERING DRAWINGS
ASME Y14.20	20	GENERAL PRINCIPLES OF MECHANICAL ENGINEERING DRAWINGS
ASME Y14.21	21	GENERAL PRINCIPLES OF ELECTRICAL ENGINEERING DRAWINGS
ASME Y14.22	22	GENERAL PRINCIPLES OF PNEUMATIC AND HYDRAULIC ENGINEERING DRAWINGS
ASME Y14.23	23	GENERAL PRINCIPLES OF METALLURGICAL ENGINEERING DRAWINGS
ASME Y14.24	24	GENERAL PRINCIPLES OF AERONAUTICAL ENGINEERING DRAWINGS
ASME Y14.25	25	GENERAL PRINCIPLES OF MARINE ENGINEERING DRAWINGS
ASME Y14.26	26	GENERAL PRINCIPLES OF AGRICULTURAL ENGINEERING DRAWINGS
ASME Y14.27	27	GENERAL PRINCIPLES OF MINING ENGINEERING DRAWINGS
ASME Y14.28	28	GENERAL PRINCIPLES OF INDUSTRIAL ENGINEERING DRAWINGS
ASME Y14.29	29	GENERAL PRINCIPLES OF MECHANICAL ENGINEERING DRAWINGS
ASME Y14.30	30	GENERAL PRINCIPLES OF ELECTRICAL ENGINEERING DRAWINGS
ASME Y14.31	31	GENERAL PRINCIPLES OF PNEUMATIC AND HYDRAULIC ENGINEERING DRAWINGS
ASME Y14.32	32	GENERAL PRINCIPLES OF METALLURGICAL ENGINEERING DRAWINGS
ASME Y14.33	33	GENERAL PRINCIPLES OF AERONAUTICAL ENGINEERING DRAWINGS
ASME Y14.34	34	GENERAL PRINCIPLES OF MARINE ENGINEERING DRAWINGS
ASME Y14.35	35	GENERAL PRINCIPLES OF AGRICULTURAL ENGINEERING DRAWINGS
ASME Y14.36	36	GENERAL PRINCIPLES OF MINING ENGINEERING DRAWINGS
ASME Y14.37	37	GENERAL PRINCIPLES OF INDUSTRIAL ENGINEERING DRAWINGS
ASME Y14.38	38	GENERAL PRINCIPLES OF MECHANICAL ENGINEERING DRAWINGS
ASME Y14.39	39	GENERAL PRINCIPLES OF ELECTRICAL ENGINEERING DRAWINGS
ASME Y14.40	40	GENERAL PRINCIPLES OF PNEUMATIC AND HYDRAULIC ENGINEERING DRAWINGS
ASME Y14.41	41	GENERAL PRINCIPLES OF METALLURGICAL ENGINEERING DRAWINGS
ASME Y14.42	42	GENERAL PRINCIPLES OF AERONAUTICAL ENGINEERING DRAWINGS
ASME Y14.43	43	GENERAL PRINCIPLES OF MARINE ENGINEERING DRAWINGS
ASME Y14.44	44	GENERAL PRINCIPLES OF AGRICULTURAL ENGINEERING DRAWINGS
ASME Y14.45	45	GENERAL PRINCIPLES OF MINING ENGINEERING DRAWINGS
ASME Y14.46	46	GENERAL PRINCIPLES OF INDUSTRIAL ENGINEERING DRAWINGS
ASME Y14.47	47	GENERAL PRINCIPLES OF MECHANICAL ENGINEERING DRAWINGS
ASME Y14.48	48	GENERAL PRINCIPLES OF ELECTRICAL ENGINEERING DRAWINGS
ASME Y14.49	49	GENERAL PRINCIPLES OF PNEUMATIC AND HYDRAULIC ENGINEERING DRAWINGS
ASME Y14.50	50	GENERAL PRINCIPLES OF METALLURGICAL ENGINEERING DRAWINGS
ASME Y14.51	51	GENERAL PRINCIPLES OF AERONAUTICAL ENGINEERING DRAWINGS
ASME Y14.52	52	GENERAL PRINCIPLES OF MARINE ENGINEERING DRAWINGS
ASME Y14.53	53	GENERAL PRINCIPLES OF AGRICULTURAL ENGINEERING DRAWINGS
ASME Y14.54	54	GENERAL PRINCIPLES OF MINING ENGINEERING DRAWINGS
ASME Y14.55	55	GENERAL PRINCIPLES OF INDUSTRIAL ENGINEERING DRAWINGS
ASME Y14.56	56	GENERAL PRINCIPLES OF MECHANICAL ENGINEERING DRAWINGS
ASME Y14.57	57	GENERAL PRINCIPLES OF ELECTRICAL ENGINEERING DRAWINGS
ASME Y14.58	58	GENERAL PRINCIPLES OF PNEUMATIC AND HYDRAULIC ENGINEERING DRAWINGS
ASME Y14.59	59	GENERAL PRINCIPLES OF METALLURGICAL ENGINEERING DRAWINGS
ASME Y14.60	60	GENERAL PRINCIPLES OF AERONAUTICAL ENGINEERING DRAWINGS
ASME Y14.61	61	GENERAL PRINCIPLES OF MARINE ENGINEERING DRAWINGS
ASME Y14.62	62	GENERAL PRINCIPLES OF AGRICULTURAL ENGINEERING DRAWINGS
ASME Y14.63	63	GENERAL PRINCIPLES OF MINING ENGINEERING DRAWINGS
ASME Y14.64	64	GENERAL PRINCIPLES OF INDUSTRIAL ENGINEERING DRAWINGS
ASME Y14.65	65	GENERAL PRINCIPLES OF MECHANICAL ENGINEERING DRAWINGS
ASME Y14.66	66	GENERAL PRINCIPLES OF ELECTRICAL ENGINEERING DRAWINGS
ASME Y14.67	67	GENERAL PRINCIPLES OF PNEUMATIC AND HYDRAULIC ENGINEERING DRAWINGS
ASME Y14.68	68	GENERAL PRINCIPLES OF METALLURGICAL ENGINEERING DRAWINGS
ASME Y14.69	69	GENERAL PRINCIPLES OF AERONAUTICAL ENGINEERING DRAWINGS
ASME Y14.70	70	GENERAL PRINCIPLES OF MARINE ENGINEERING DRAWINGS
ASME Y14.71	71	GENERAL PRINCIPLES OF AGRICULTURAL ENGINEERING DRAWINGS
ASME Y14.72	72	GENERAL PRINCIPLES OF MINING ENGINEERING DRAWINGS
ASME Y14.73	73	GENERAL PRINCIPLES OF INDUSTRIAL ENGINEERING DRAWINGS
ASME Y14.74	74	GENERAL PRINCIPLES OF MECHANICAL ENGINEERING DRAWINGS
ASME Y14.75	75	GENERAL PRINCIPLES OF ELECTRICAL ENGINEERING DRAWINGS
ASME Y14.76	76	GENERAL PRINCIPLES OF PNEUMATIC AND HYDRAULIC ENGINEERING DRAWINGS
ASME Y14.77	77	GENERAL PRINCIPLES OF METALLURGICAL ENGINEERING DRAWINGS
ASME Y14.78	78	GENERAL PRINCIPLES OF AERONAUTICAL ENGINEERING DRAWINGS
ASME Y14.79	79	GENERAL PRINCIPLES OF MARINE ENGINEERING DRAWINGS
ASME Y14.80	80	GENERAL PRINCIPLES OF AGRICULTURAL ENGINEERING DRAWINGS
ASME Y14.81	81	GENERAL PRINCIPLES OF MINING ENGINEERING DRAWINGS
ASME Y14.82	82	GENERAL PRINCIPLES OF INDUSTRIAL ENGINEERING DRAWINGS
ASME Y14.83	83	GENERAL PRINCIPLES OF MECHANICAL ENGINEERING DRAWINGS
ASME Y14.84	84	GENERAL PRINCIPLES OF ELECTRICAL ENGINEERING DRAWINGS
ASME Y14.85	85	GENERAL PRINCIPLES OF PNEUMATIC AND HYDRAULIC ENGINEERING DRAWINGS
ASME Y14.86	86	GENERAL PRINCIPLES OF METALLURGICAL ENGINEERING DRAWINGS
ASME Y14.87	87	GENERAL PRINCIPLES OF AERONAUTICAL ENGINEERING DRAWINGS
ASME Y14.88	88	GENERAL PRINCIPLES OF MARINE ENGINEERING DRAWINGS
ASME Y14.89	89	GENERAL PRINCIPLES OF AGRICULTURAL ENGINEERING DRAWINGS
ASME Y14.90	90	GENERAL PRINCIPLES OF MINING ENGINEERING DRAWINGS
ASME Y14.91	91	GENERAL PRINCIPLES OF INDUSTRIAL ENGINEERING DRAWINGS
ASME Y14.92	92	GENERAL PRINCIPLES OF MECHANICAL ENGINEERING DRAWINGS
ASME Y14.93	93	GENERAL PRINCIPLES OF ELECTRICAL ENGINEERING DRAWINGS
ASME Y14.94	94	GENERAL PRINCIPLES OF PNEUMATIC AND HYDRAULIC ENGINEERING DRAWINGS
ASME Y14.95	95	GENERAL PRINCIPLES OF METALLURGICAL ENGINEERING DRAWINGS
ASME Y14.96	96	GENERAL PRINCIPLES OF AERONAUTICAL ENGINEERING DRAWINGS
ASME Y14.97	97	GENERAL PRINCIPLES OF MARINE ENGINEERING DRAWINGS
ASME Y14.98	98	GENERAL PRINCIPLES OF AGRICULTURAL ENGINEERING DRAWINGS
ASME Y14.99	99	GENERAL PRINCIPLES OF MINING ENGINEERING DRAWINGS
ASME Y14.100	100	GENERAL PRINCIPLES OF INDUSTRIAL ENGINEERING DRAWINGS







1. USE CURRENT EDITION OF THE AASHTO A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS FOR DESIGN OF ROADWAY ELEMENTS NOT SHOWN ON THIS STD DWG.
2. USE CURRENT EDITION OF THE AASHTO ROADSIDE DESIGN GUIDE FOR CLEAR ZONE REQUIREMENTS NOT SHOWN ON THIS STD DWG.
3. FOR DECELERATION LENGTH:  
RIGHT TURN - USE THE POSTED SPEED LIMIT AS THE DESIGN SPEED AND AN AVERAGE RUNNING SPEED OF 14 MPH.  
LEFT TURN - USE THE POSTED SPEED LIMIT AS THE DESIGN SPEED AND AN AVERAGE RUNNING SPEED OF A STOP CONDITION.  
ADJUST FOR SPEED CHANGES ON GRADES AS NECESSARY.
4. FOR ACCELERATION LENGTH:  
USE AN INITIAL RUNNING SPEED OF 14 MPH AND USE THE POSTED SPEED LIMIT AS THE DESIGN SPEED.  
ADJUST FOR SPEED CHANGES ON GRADES AS NECESSARY.
5. USE STD DWG DD 14A FOR RIGHT TURN AND/OR LEFT TURN ACCELERATION LANES IF REQUIRED. USE "D" VALUES IN THIS STD DWG FOR CALCULATIONS.
6. USE 4 FEET MINIMUM SHOULDER FOR RIGHT TURN DECELERATION LANE TAPER, RIGHT TURN STORAGE LANE, RIGHT TURN ACCELERATION LANE, AND RIGHT TURN ACCELERATION LANE TAPER. MATCH EXISTING WIDTH OF SHOULDER, WITH A 4 FEET MINIMUM, AT ALL OTHER SHOULDER LOCATIONS.
7. USE A 16 FEET MINIMUM ACCEPTANCE LANE FOR 50 FEET WITH A 15:1 TAPER WHEN RIGHT TURN ACCELERATION LANE IS NOT USED.
8. STANDARDS SHOWN ARE RECOMMENDED VALUES. EXCEED STANDARDS IF CONDITIONS PERMIT.
9.  $G = 140'$  FOR SPEEDS 45 TO 50 MPH  
 $G = 180'$  FOR SPEEDS 55 MPH AND ABOVE
10. INCREASE VEHICLE STORAGE LENGTH AS DETERMINED BY ENGINEERING STUDY OR REGION TRAFFIC ENGINEER.
11. SEE STD DWG ST 5 FOR INFORMATION ON STRIPING DETAILS.
12. FOR POSTED SPEED  $\geq 45$  MPH  $L = WS$   
 $L$  = TAPER LENGTH IN FEET  
 $W$  = WIDTH OF OFFSET IN FEET  
 $S$  = SPEED IN MPH
13. PROVIDE A TWO WAY LEFT TURN LANE CONNECTING ADJACENT ACCESS POINTS WHEN THEIR, TAPERS OVERLAP, OR AS REQUIRED BY THE REGION TRAFFIC ENGINEER.
14. OPTIONAL USE OF W4-2R, RIGHT LANE ENDS SIGN, AT A DISTANCE "D" UPSTREAM FROM THE BEGINNING OF THE TAPER.

\* OPTIONAL FOR 50 MPH AND LESS. FOR 55 MPH, AS REQUIRED  
BY THE REGION TRAFFIC ENGINEER. SEE NOTE 10  
\*\* AS REQUIRED BY THE REGION TRAFFIC ENGINEER.  
VPH= VEHICLES PER HOUR

SUPPLEMENTAL DRAWING

TYPICAL RURAL 2 LANE ROAD INTERSECTION (HIGH SPEED)		UTAH DEPARTMENT OF TRANSPORTATION STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION SAINT LARK, UTAH		REVISIONS 1 04/26/07 JL NEW DRAWING.	
STANDARD DRAWING TITLE		RECOMMENDED FOR APPROVAL 		APR.26,2007 DATE	
		CHAIRMAN STANDARDS COMMITTEE APPROVED 		APR.26,2007 DATE	
		DEPUTY DIRECTOR		NO. DATE APPR. REMARKS	

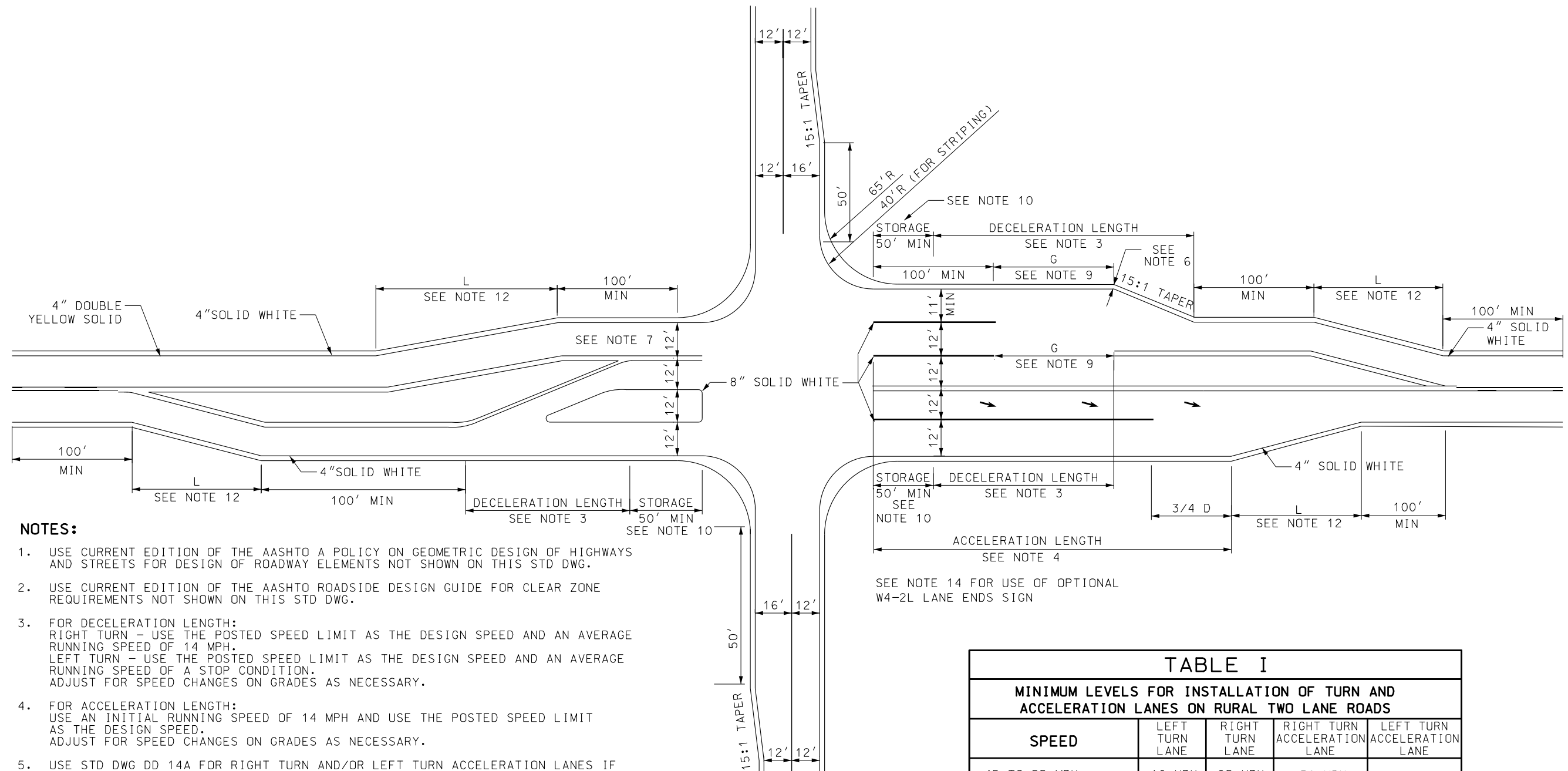
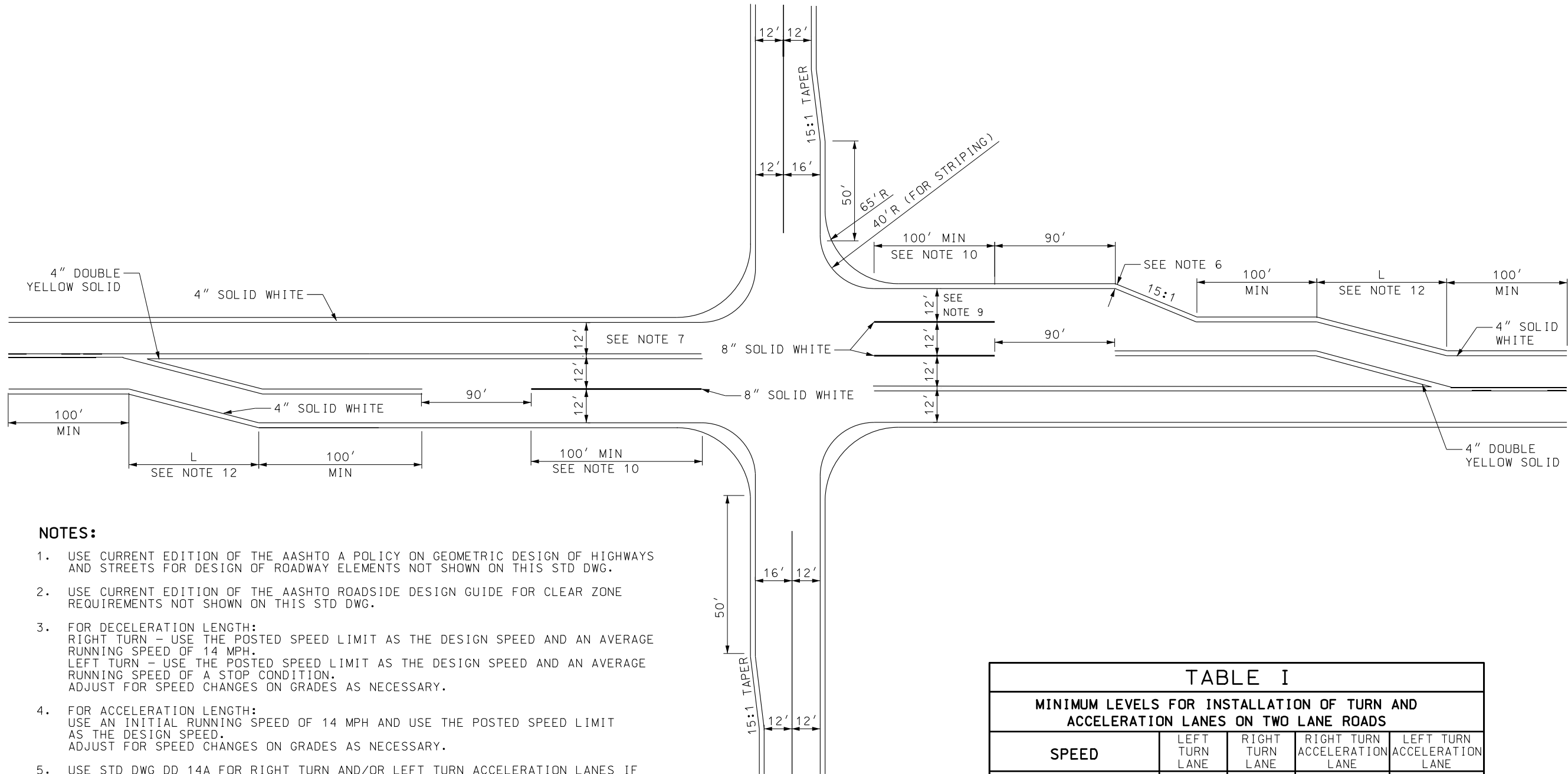


TABLE I

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MINIMUM LEVELS FOR INSTALLATION OF TURN AND  
ACCELERATION LANES ON RURAL TWO LANE ROADS

D:\01-Standard Drawings\Imperial\2005\Approved\Supplemental\Issues\Supp2\Approved\DD15B.dgn 08-MAY-2007



NOTES:

1. USE CURRENT EDITION OF THE AASHTO A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS FOR DESIGN OF ROADWAY ELEMENTS NOT SHOWN ON THIS STD DWG.
2. USE CURRENT EDITION OF THE AASHTO ROADSIDE DESIGN GUIDE FOR CLEAR ZONE REQUIREMENTS NOT SHOWN ON THIS STD DWG.
3. FOR DECELERATION LENGTH:  
RIGHT TURN - USE THE POSTED SPEED LIMIT AS THE DESIGN SPEED AND AN AVERAGE RUNNING SPEED OF 14 MPH.  
LEFT TURN - USE THE POSTED SPEED LIMIT AS THE DESIGN SPEED AND AN AVERAGE RUNNING SPEED OF A STOP CONDITION.  
ADJUST FOR SPEED CHANGES ON GRADES AS NECESSARY.
4. FOR ACCELERATION LENGTH:  
USE AN INITIAL RUNNING SPEED OF 14 MPH AND USE THE POSTED SPEED LIMIT AS THE DESIGN SPEED.  
ADJUST FOR SPEED CHANGES ON GRADES AS NECESSARY.
5. USE STD DWG DD 14A FOR RIGHT TURN AND/OR LEFT TURN ACCELERATION LANES IF REQUIRED. USE "D" VALUES IN THIS STD DWG FOR DESIGN.
6. USE 4 FEET MINIMUM SHOULDER FOR RIGHT TURN DECELERATION LANE TAPER, RIGHT TURN STORAGE LANE, RIGHT TURN ACCELERATION LANE, AND RIGHT TURN ACCELERATION LANE TAPER. MATCH EXISTING WIDTH OF SHOULDER, WITH A 4 FEET MINIMUM, AT ALL OTHER SHOULDER LOCATIONS.
7. USE A 16 FEET MINIMUM ACCEPTANCE LANE FOR 50 FEET WITH A 15:1 TAPER WHEN RIGHT TURN ACCELERATION LANE IS NOT USED.
8. STANDARDS SHOWN ARE RECOMMENDED VALUES. EXCEED STANDARDS IF CONDITIONS PERMIT.
9. 12' LANE WIDTH DESIRABLE  
10' MINIMUM LOW VOLUME LOW SPEED.
10. INCREASE VEHICLE STORAGE LENGTH AS DETERMINED BY ENGINEERING STUDY OR REGION TRAFFIC ENGINEER.
11. SEE STD DWG ST 5 FOR INFORMATION ON STRIPING DETAILS.
12. FOR POSTED SPEED  $\leq 40$  MPH  $L = \frac{WS^2}{60}$   
L = TAPER LENGTH IN FEET  
W = WIDTH OF OFFSET IN FEET  
S = SPEED IN MPH
13. PROVIDE A TWO WAY LEFT TURN LANE CONNECTING ADJACENT ACCESS POINTS WHEN THEIR TAPERS OVERLAP, OR AS REQUIRED BY THE REGION TRAFFIC ENGINEER.

TABLE I				
MINIMUM LEVELS FOR INSTALLATION OF TURN AND ACCELERATION LANES ON TWO LANE ROADS				
SPEED	LEFT TURN LANE	RIGHT TURN LANE	RIGHT TURN ACCELERATION LANE	LEFT TURN ACCELERATION LANE
40 MPH AND LESS	25 VPH	50 VPH	*OPTIONAL	*OPTIONAL

VPH= VEHICLES PER HOUR IN ANY ONE HOUR PERIOD IN PASSENGER CAR EQUIVALENTS.  
\* SEE NOTE 9.

"D" DISTANCE		
SPEED MPH	"D" FEET	3/4 "D" FEET
25	325	245
30	450	340
35	550	415
40	650	490

SUPPLEMENTAL DRAWING

UTAH DEPARTMENT OF TRANSPORTATION  
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION  
SALT LAKE COUNTY  
RECOMMENDED FOR APPROVAL  
CHAIRMAN STANDARDS COMMITTEE  
APPROVED  
DEPUTY DIRECTOR

TYPICAL RURAL  
2 LANE ROAD  
INTERSECTION  
(LOW SPEED)

STD DWG  
DD 15B

REVISIONS  
1 04/26/07 JL NEW DRAWING.

DATE  
APR.26.2007

DATE  
APR.26.2007

REMARKS



The diagram illustrates a cross-section of a bridge structure. The bridge deck is shown with a hatched pattern, supported by two abutments labeled "ABUT." with centerlines "C. ABUT.". The bridge spans a distance of 300' on each side of the abutments. The embankment on the left is labeled "EMBANKMENT FOR BRIDGE" and shows a slope with a 1:2 ratio. The existing ground is labeled "EXISTING GROUND" and the finish grade is labeled "FINISH GRADE". The pavement is labeled "PAVEMENT". The bench details are labeled "3' BENCH TYP." and show a 3' wide bench with a 1:2 slope. The diagram also includes a "3' BENCH TYP." label on the right side.

BRIDGE

NEW ADJOINING ROAD

10'

EMBANKMENT FOR BRIDGE

APPROACH ROAD

A

A

The diagram illustrates a cross-section of a bridge approach road. A vertical dashed line labeled 'C' indicates the centerline of the 'APPROACH ROAD'. The road surface is shown with a 10' width. The existing ground is represented by a hatched area at the base. The embankment for the bridge is shown as a stepped structure on the right side, with a vertical height of 10'. A new adjoining embankment is shown on the left side, with a vertical height of 10'. The existing material is shown as a hatched area on the left side. The diagram is labeled with 'NEW ADJOINING EMBANKMENT', 'EXISTING GROUND', 'EMBANKMENT FOR BRIDGE', and 'EXISTING MATERIAL'.

BRIDGE

E.O.P.

INTERSECTING ROAD

EMBANKMENT FOR BRIDGE

60'

60'

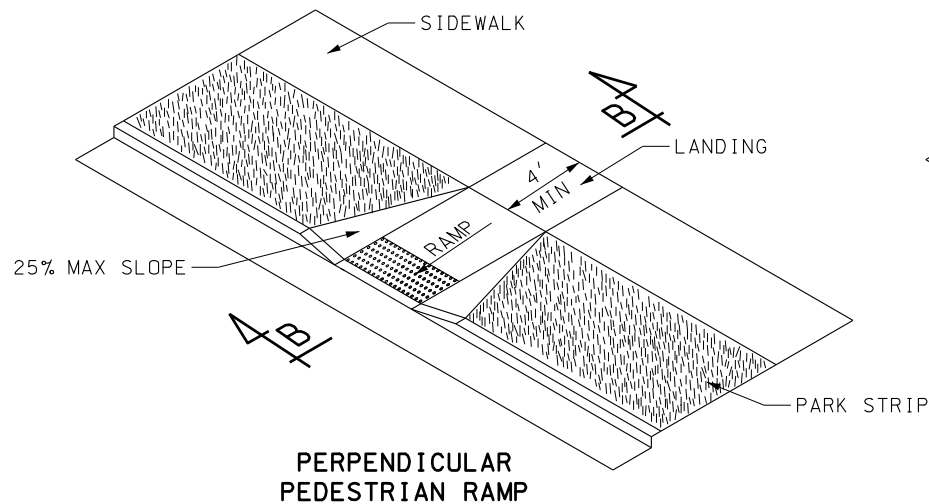
A cross-sectional diagram of a bridge approach road. The diagram shows a central bridge structure with a width of 60 feet, indicated by a dimension line and the text "60'". The bridge is supported by a central pier and two side piers. The approach road is shown on both sides of the bridge, with a width of 60 feet on each side, also indicated by dimension lines and the text "60'". The top surface of the approach road is labeled "FINISH GRADE". The existing ground level is shown as a hatched area at the bottom, labeled "EXISTING GROUND". The embankment for the bridge is shown as a hatched area on the sides, labeled "EMBANKMENT FOR BRIDGE". The diagram includes various symbols: a double asterisk (\*\*) above the central pier, a single asterisk (\*) above the side piers, and a small square with a diagonal line (1) at the base of the embankment on both sides.

\*\* INDICATES EDGE OF PAVEMENT  
TO EDGE OF PAVEMENT DIMENSION.

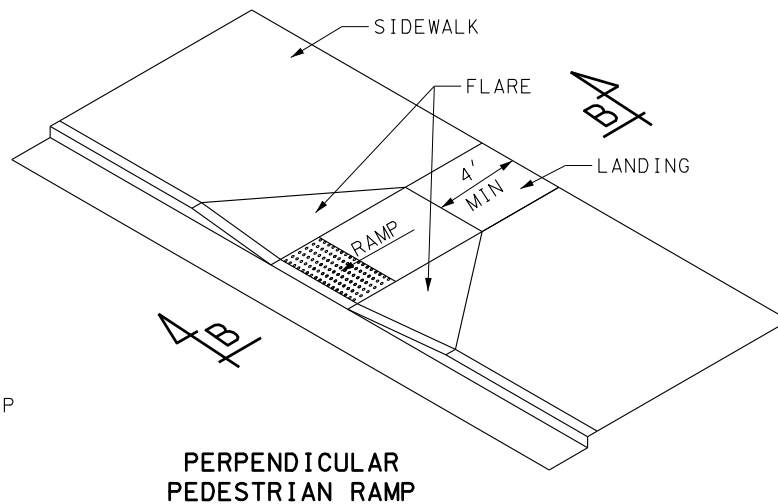
SUPPLEMENTAL DRAWING

STD DWG  
DD 16

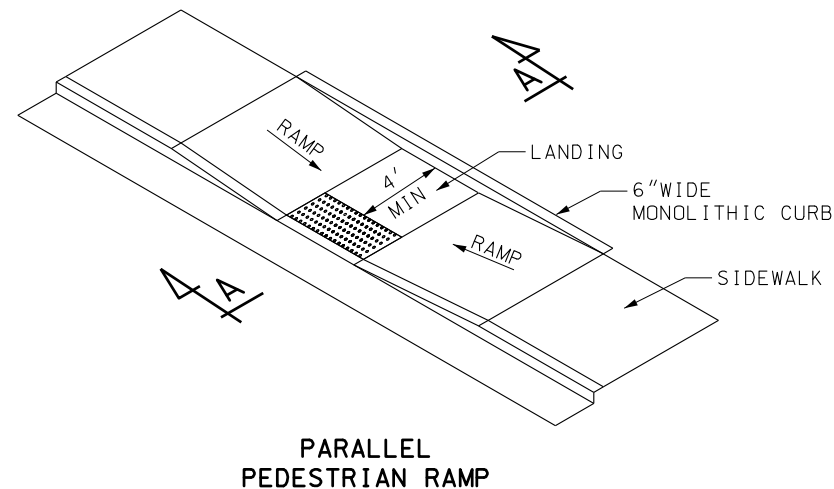
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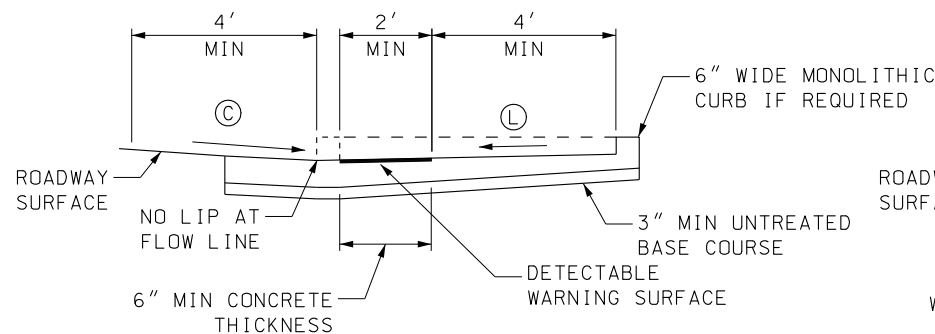
PERPENDICULAR  
PEDESTRIAN RAMP



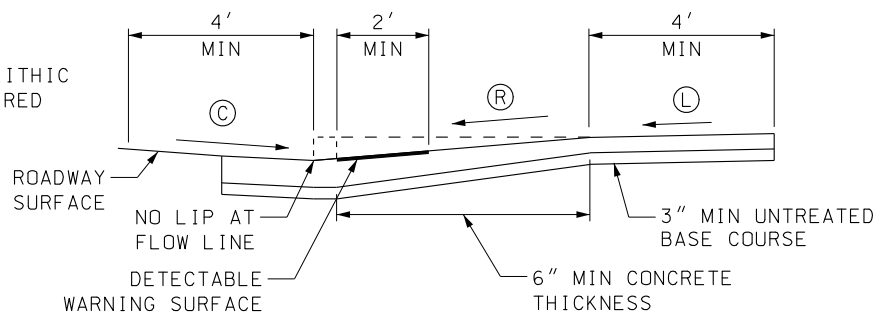
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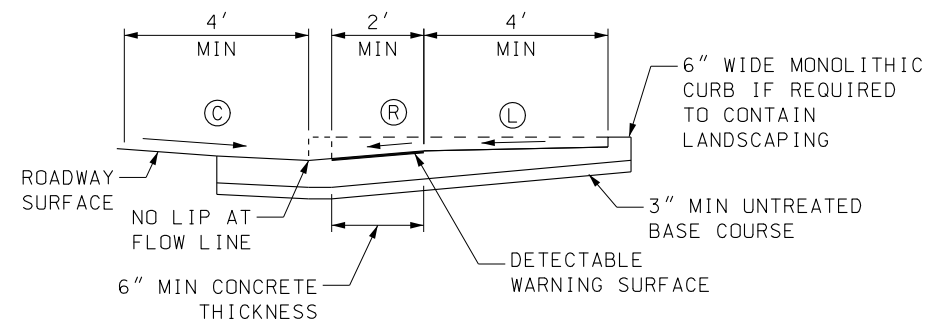
PARALLEL  
PEDESTRIAN RAMP



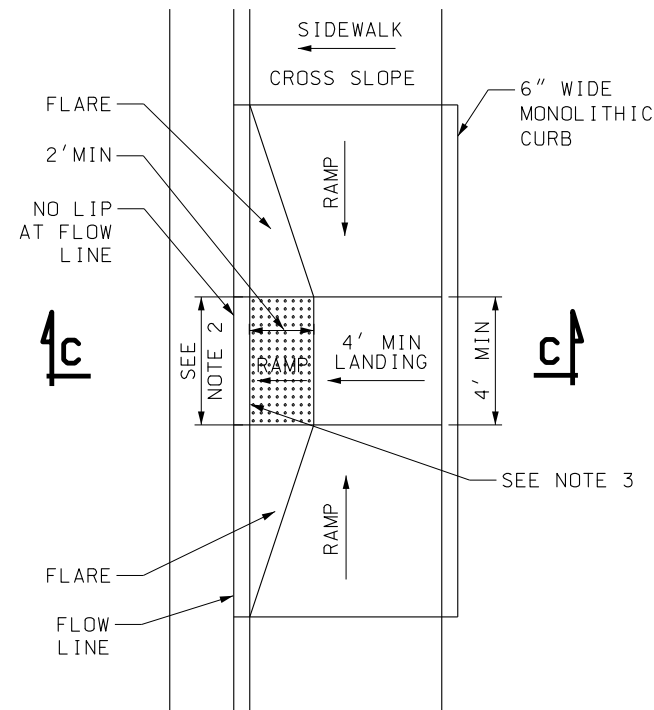
SECTION A-A



SECTION B-B



SECTION C-C



PEDESTRIAN ACCESS  
RAMP DETAIL

SLOPE TABLE			
	ITEM	MAX. RUNNING SLOPE *	MAX. CROSS SLOPE *
(L)	LANDING	2% (1V:48H) (b)	2% (1V:48H) (b)
(R)	RAMP	8.33% (1V:12H) (c)	2% (1V:48H) (d)
(C)	CLEAR SPACE	5% (1V:20H) (a)	2% (1V:48H) (d)
	SIDEWALK	--	2% (1V:48H)
	FLARE	10% (1V:10H)	--

- \* RUNNING SLOPE IS IN THE DIRECTION OF PEDESTRIAN TRAVEL. CROSS SLOPE IS PERPENDICULAR TO PEDESTRIAN TRAVEL.
- (a) TRANSITION RUNNING SLOPE NEEDS TO BE CONSISTENT ACROSS ENTIRE CURB CUT. WARP GUTTER PAN TO MEET REQUIRED TRANSITION SLOPE AT CURB CUT.
- EXCEPTIONS:
- (b) SLOPE REQUIREMENTS DO NOT APPLY AT MID-BLOCK CROSSINGS.
- (c) PARALLEL RAMPS ARE NOT REQUIRED TO EXCEED 15-FEET IN LENGTH.
- (d) CROSS SLOPE REQUIREMENT DOES NOT APPLY AT PERPENDICULAR RAMP MID-BLOCK CROSSING.

GENERAL NOTES:

1. SITE CONDITIONS WILL VARY. CONFIGURATION OF RAMP, LANDING, AND TRANSITION MAY BE CHANGED, BUT THEY MUST MEET DIMENSIONS AND SLOPES SHOWN HERE. THE USE OF FLARES, CURBWALLS, ETC. ARE AT THE DISCRETION OF THE ENGINEER.
2. PROVIDE DETECTABLE WARNING SURFACE FOR FULL WIDTH OF CURB CUT. SEE DETAIL A ON GW 5C FOR DETECTABLE WARNING SURFACE DIMENSIONS.
3. LOCATE DETECTABLE WARNING SURFACE SO THE EDGE NEAREST THE STREET IS AT OR WITHIN 2" OF THE BACK OF CURB.
4. PERPENDICULAR AND PARALLEL PEDESTRIAN RAMPS SHOWN ON THIS DRAWING ARE ACCEPTABLE FOR USE AT MID-BLOCK OR CORNER INSTALLATIONS. REFER TO STD DWG GW 5B AND GW 5C FOR EXAMPLES OF CORNER INSTALLATIONS.
5. PROVIDE DETECTABLE WARNING SURFACE COLOR THAT CONTRASTS WITH ADJACENT WALKING SURFACE, EITHER LIGHT-ON-DARK OR DARK-ON-LIGHT. ACCEPTABLE COLORS INCLUDE: RED, BLACK, OR YELLOW.
6. USE CLASS AA(AE) CONCRETE.
7. USE UNTREATED BASE COURSE UNDER ALL CONCRETE FLATWORK.
8. WHEN DETECTABLE WARNING SURFACE IS CUT, GRIND OFF REMAINING PORTION OF ANY CUT DOMES. SEAL ALL CUT PANEL EDGES TO PREVENT WATER DAMAGE.
9. LOCATE CURB CUT WITHIN CROSSWALK.
10. RAMP GRADE BREAK MUST BE PERPENDICULAR TO THE RUNNING SLOPE.

SUPPLEMENTAL DRAWING

UTAH DEPARTMENT OF TRANSPORTATION

STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

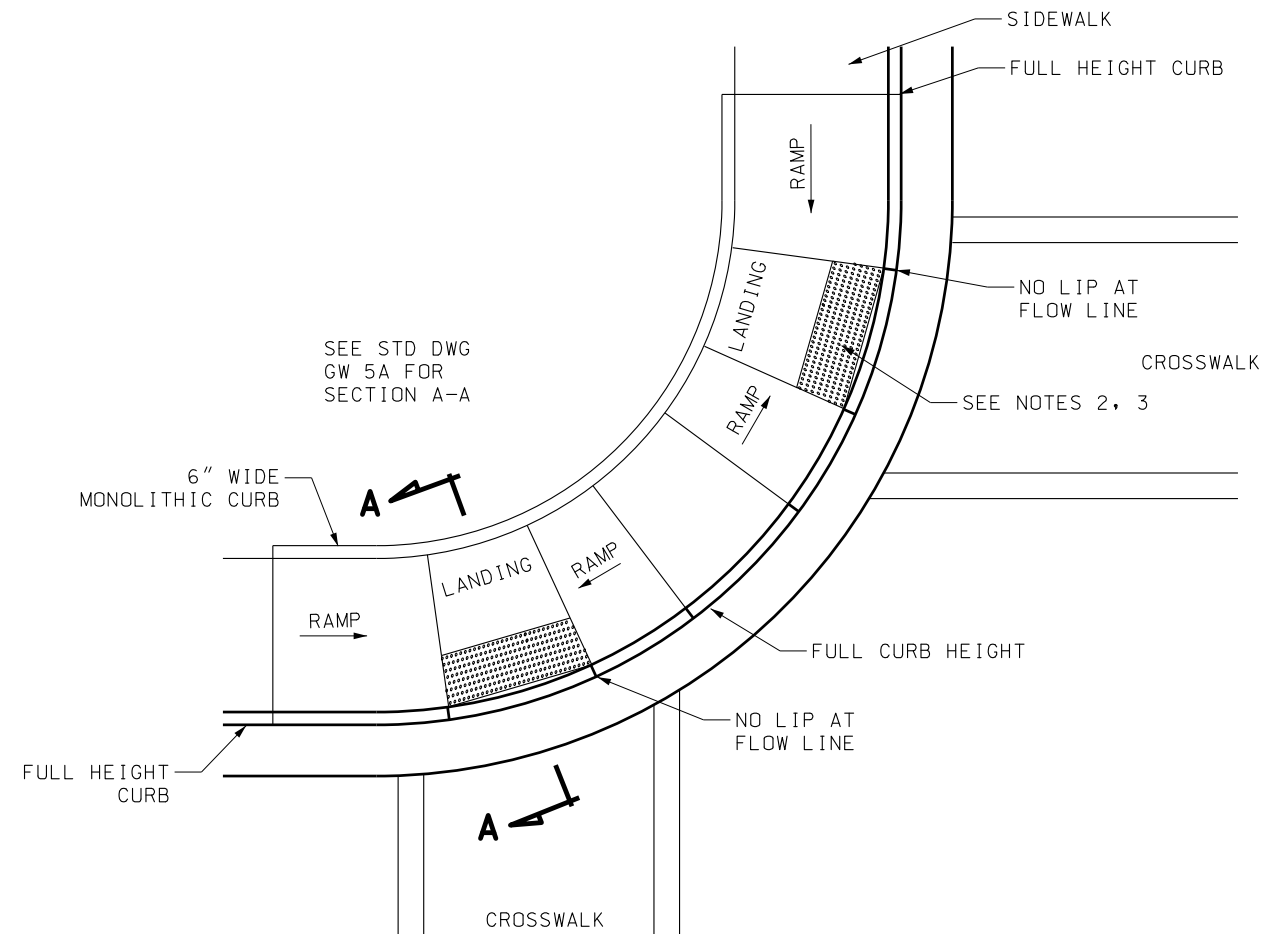
PEDESTRIAN ACCESS

STD DWG  
GW 5A

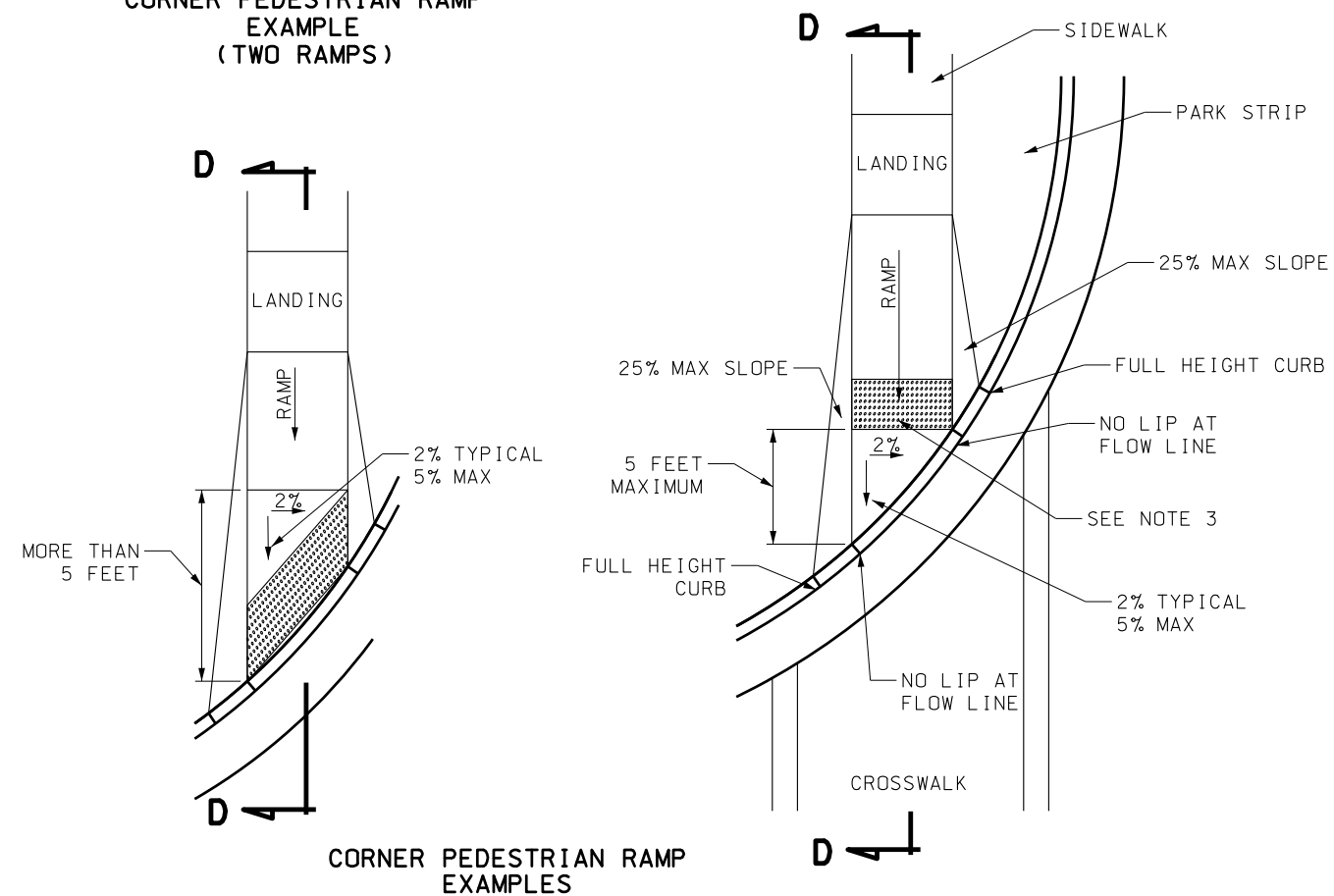
REVISIONS

1	06/30/05	L.M.	PERPENDICULAR PEDESTRIAN RAMP DETAIL MODIFIED.
2	02/23/06	L.M.	SECTION A-A, B-B, AND C-C MODIFIED TO CLARIFY 1" DIMENSION.
3	04/26/07	W.S.	SECTIONS A-A, B-B, AND C-C MODIFIED, ADDED NOTES, REMOVED DETAIL A.

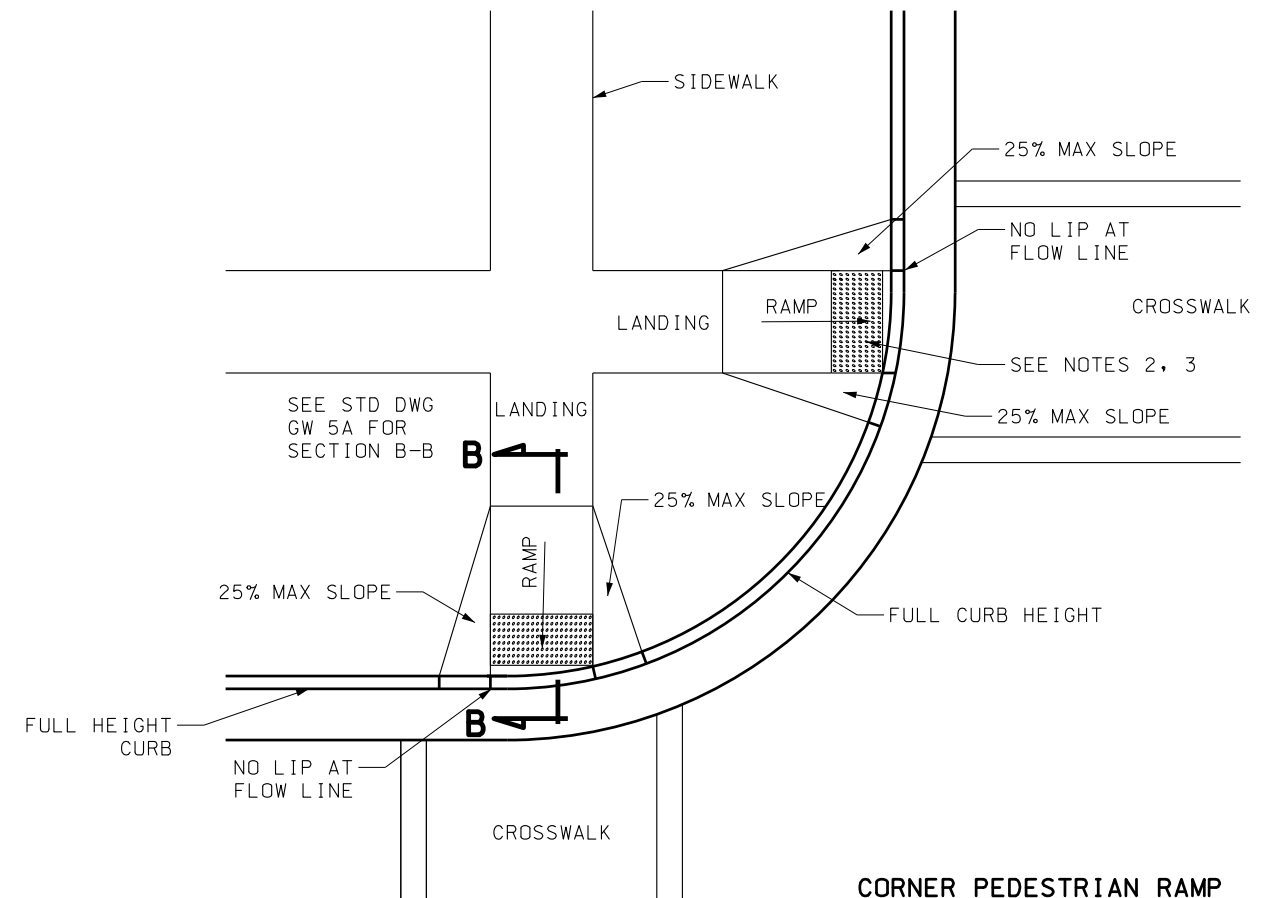
RECOMMENDED FOR APPROVAL  
SALT LAKE COUNTY  
CHAIRMAN STANDARDS COMMITTEE  
APR 26, 2007  
DATE  
DEPUTY DIRECTOR  
APR 26, 2007  
DATE  
REMARKS



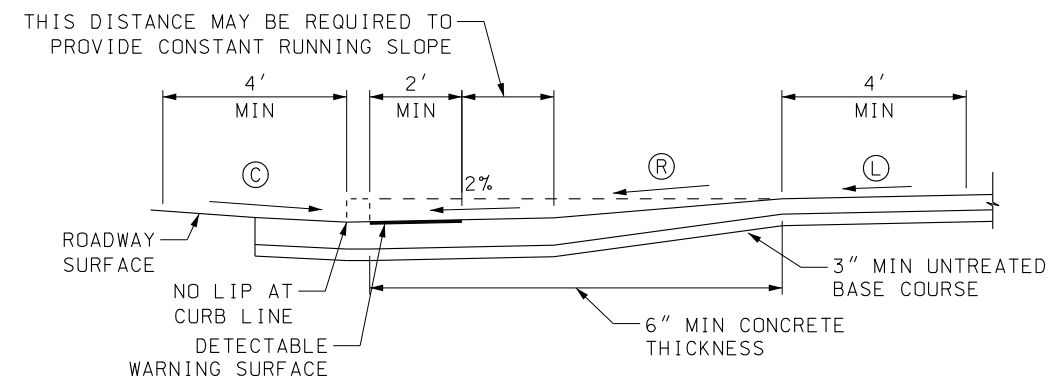
CORNER PEDESTRIAN RAMP  
EXAMPLE  
(TWO RAMPS)



## CORNER PEDESTRIAN RAMP EXAMPLES



CORNER PEDESTRIAN RAMP  
EXAMPLE  
(TWO RAMPS)



SECTION D-D

NOTES:

1. REFER TO STD DWG GW 5A FOR GENERAL NOTES AND SLOPE TABLES.
2. PROVIDE DETECTABLE WARNING SURFACE FOR FULL WIDTH OF CURB CUT.  
SEE DETAIL A ON GW 5C FOR DETECTABLE WARNING SURFACE DIMENSIONS.
3. LOCATE DETECTABLE WARNING SURFACE SO THE EDGE NEAREST THE  
STREET IS AT OR WITHIN 2" OF THE BACK OF CURB.
4. RAMP GRADE BREAK MUST BE PERPENDICULAR TO THE RUNNING SLOPE.

REVISIONS				
NO.	DATE	APPR.	REMARKS	
1	06/30/05	L.M.	CORNER PEDESTRIAN RAMP EXAMPLE DETAIL MODIFIED.	
2	02/23/06	L.M.	SECTION A-A, B-B, AND C-C MODIFIED TO CLARITY 1" DIMENSION.	
3	04/26/07	M.S.	MODIFIED CORNER PEDESTRIAN RAMP (TWO RAMPS), ADDED CORNER PEDESTRIAN RAMP, MODIFIED NOTES TO GW 5A.	

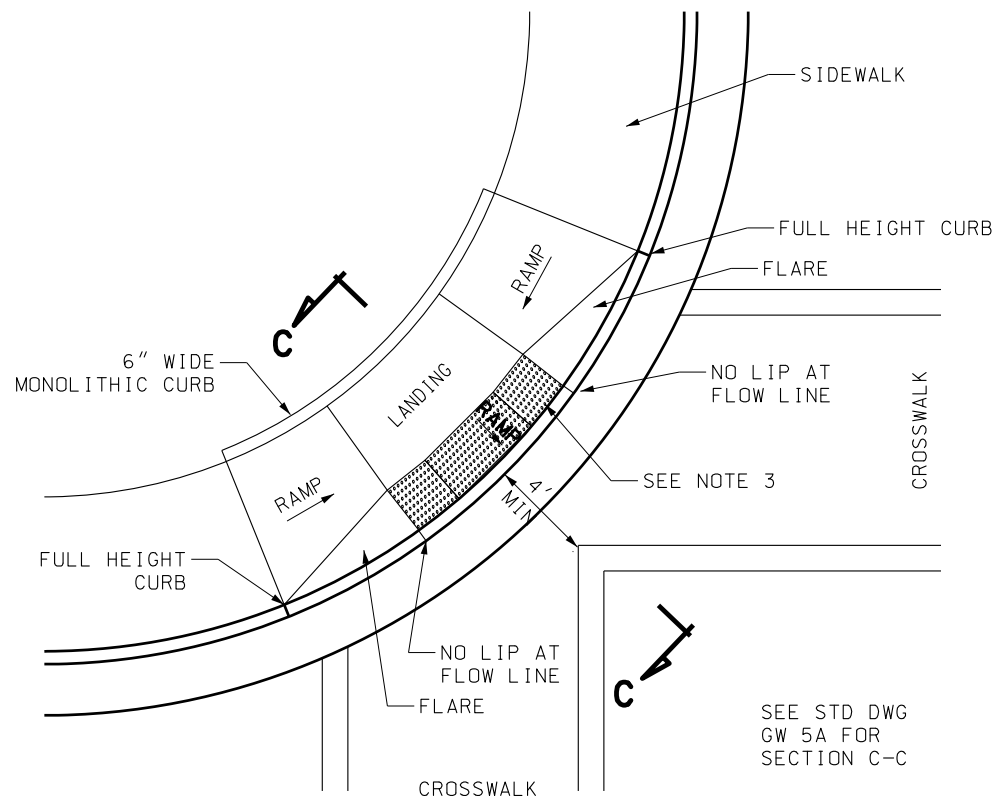
UTAH DEPARTMENT OF TRANSPORTATION  
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION  
SALE PRICE \$10.00

PEDESTRIAN ACCESS

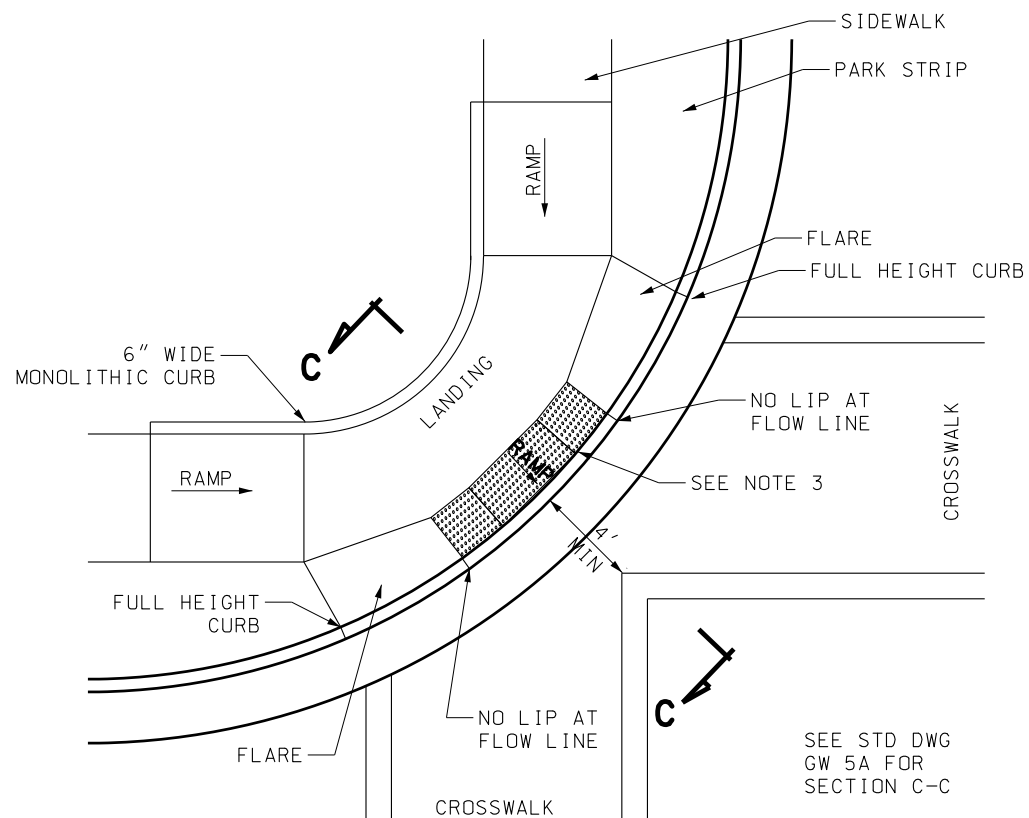
TD DWG  
W 5B

SUPPLEMENTAL DRAWING

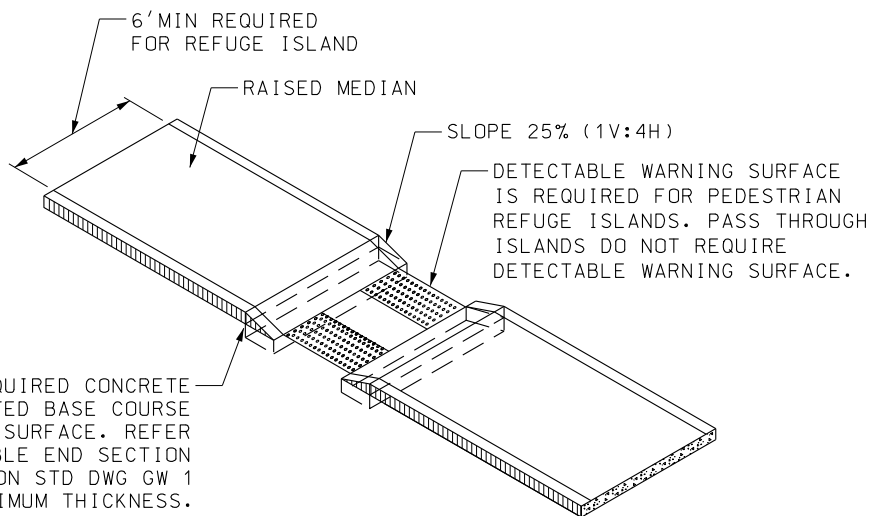
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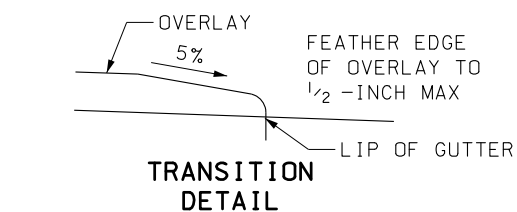
CORNER PEDESTRIAN RAMP  
EXAMPLE



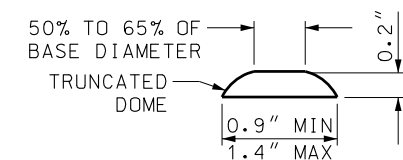
CORNER PEDESTRIAN RAMP  
EXAMPLE



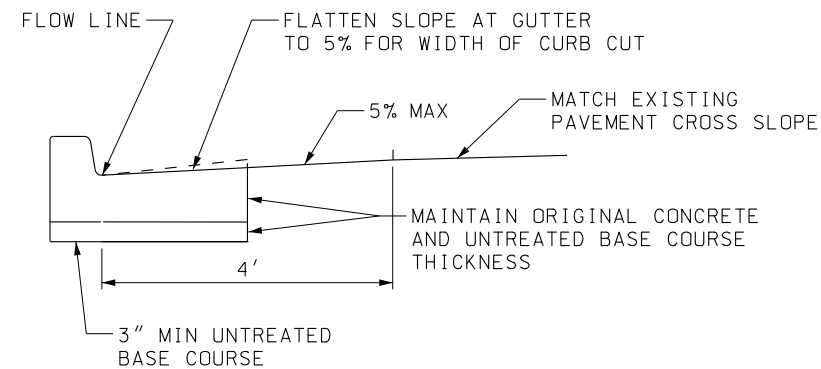
MEDIAN BREAK EXAMPLE



TRANSITION  
DETAIL



DETECTABLE WARNING SURFACE  
DETAIL A



CLEAR SPACE DETAIL

NOTES:

1. REFER TO STD DWG GW 5A FOR GENERAL NOTES AND SLOPE TABLES.
2. PROVIDE DETECTABLE WARNING SURFACE FOR FULL WIDTH OF CURB CUT.
3. LOCATE DETECTABLE WARNING SURFACE SO THE EDGE NEAREST THE STREET IS AT OR WITHIN 2" OF THE BACK OF CURB.
4. RAMP GRADE BREAK MUST BE PERPENDICULAR TO THE RUNNING SLOPE.

SUPPLEMENTAL DRAWING

UTAH DEPARTMENT OF TRANSPORTATION

STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

PEDESTRIAN ACCESS

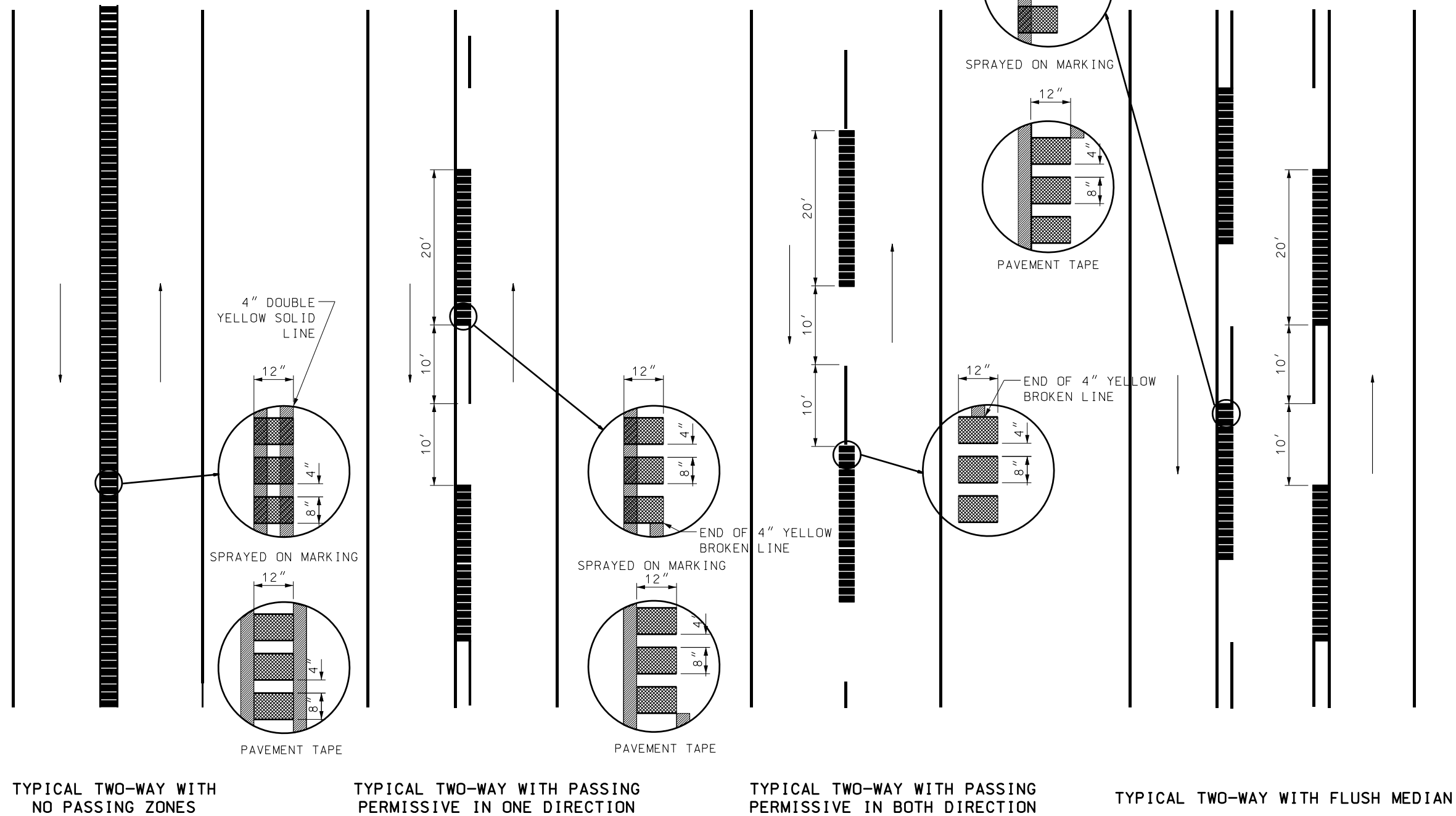
STD DWG  
GW 5C

REVISIONS

NO.	DATE	APPROVED	REMARKS
1	06/30/05	L.M.	MEDIAN BREAK EXAMPLE MODIFIED.
2	04/26/07	W.S.	ADDED TRANSITION DETAIL & DETAIL A, MODIFIED NOTES
			CORNER PEDESTRIAN RAMP NOTES MODIFIED.

RECOMMENDED FOR APPROVAL	DATE	APPROVED	DATE	APPROVED	DATE	REMARKS
CHAIRMAN STANDARDS COMMITTEE	APR.26.2007		APR.26.2007			
DEPUTY DIRECTOR						

1. REFER TO UDOT STD DWG PV 6 FOR RUMBLE STRIP DETAILS.
2. CENTER PAINT STRIPES ON RUMBLE STRIPS.
3. PLACE RUMBLE STRIPS ON DOWN STREAM SIDE OF BROKEN LINES WHEN PRACTICAL.
4. FLUSH COAT ALL RUMBLE STRIPS.



# SUPPLEMENTAL DRAWING

# RUMBLE STRIPS CENTERLINE APPLICATION

UTAH DEPARTMENT OF TRANSPORTATION  
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION  
SCALE: 1"=10'-0"

RECOMMENDED FOR APPROVAL \_\_\_\_\_ DATE APR 26, 2007

CHAIRMAN STANDARDS COMMITTEE \_\_\_\_\_ DATE APR 26, 2007

APPROVED \_\_\_\_\_ DATE \_\_\_\_\_

DEPUTY DIRECTOR \_\_\_\_\_

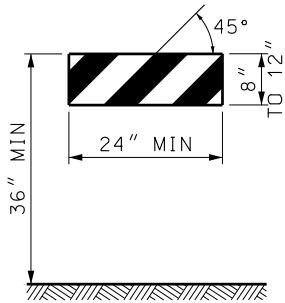
STANDARD DRAWING TITLE

STD DWG  
PV 8

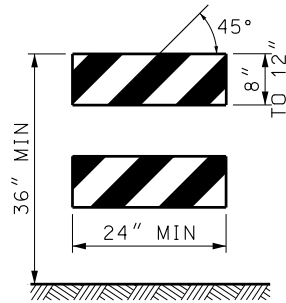
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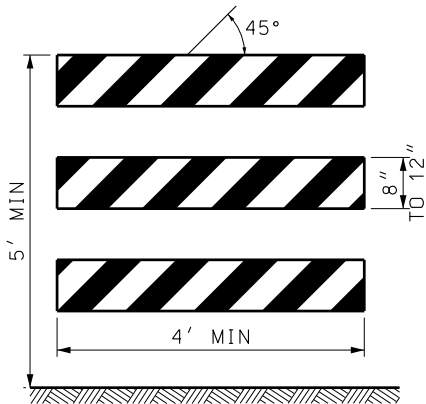
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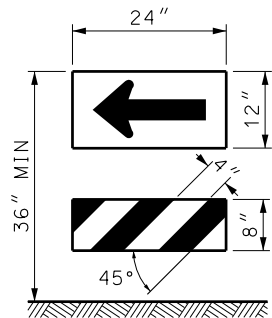
TYPE I BARRICADE



TYPE II BARRICADE



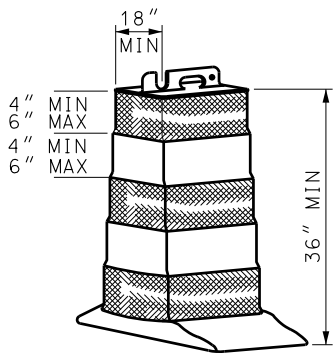
TYPE III BARRICADE



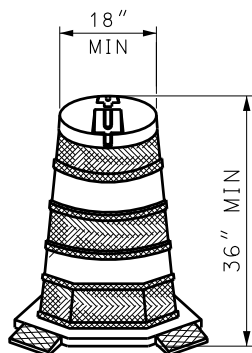
DIRECTION INDICATOR BARRICADE

BARRICADES

NOTES 1,2,6



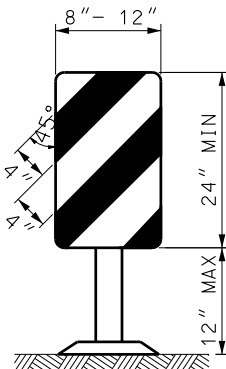
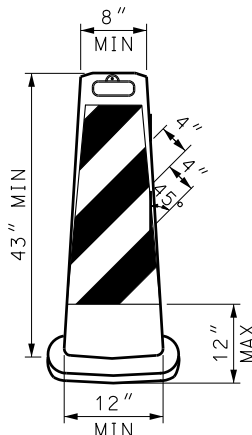
ONE-PIECE RECTANGULAR  
W/RETROREFLECTIVE BANDS



TWO-PIECE ROUND  
W/RETROREFLECTIVE BANDS

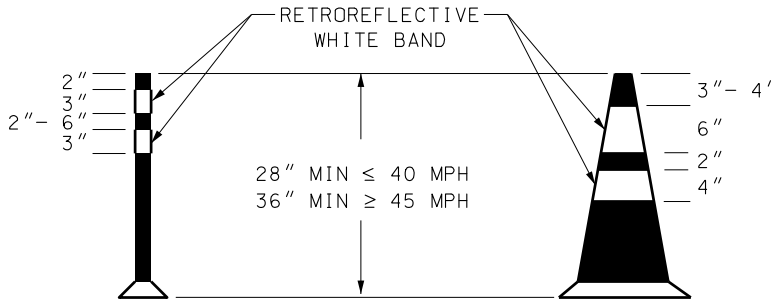
PLASTIC DRUMS

SEE NOTES 3,5,9



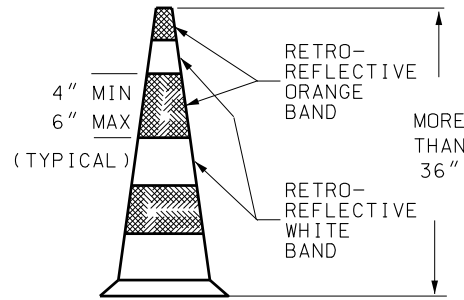
VERTICAL PANELS

SEE NOTE 1



TUBULAR MARKERS

DAYLIGHT HOURS ONLY  
SEE NOTE 5



CONES

NOTES 5,7,8,9,10,11

NOTES:

- USE A MINIMUM OF 270 SQUARE INCHES OF RETROREFLECTIVE MATERIAL PLACED A MINIMUM OF 12 INCHES ABOVE THE ROADWAY SURFACE ON BARRICADES AND VERTICAL PANELS WHEN USED ON FREEWAYS OR ROADWAYS WITH A POSTED SPEED GREATER THAN 45 MPH. PLACE BARRICADES AND VERTICAL PANELS IN SUCH A MANNER THAT THEY ARE VISIBLE TO APPROACHING TRAFFIC.
- USE SANDBAGS WITH SAND OR OTHER COMPARABLE SOFT MATERIAL AS BALLAST. DO NOT PLACE BALLAST HIGHER THAN 12 INCHES ABOVE THE ROADWAY AND DO NOT COVER ANY REFLECTIVE AREA OF RAILS OR SIGNS.
- USE PLASTIC DRUMS OR DIRECTIONAL BARRICADES AS LANE CLOSURE TAPER DEVICES FOR SPEEDS 50 MPH AND GREATER.
- USE TUBULAR MARKERS FOR DAY-TIME USE ONLY.
- WHEN DRUMS, CONES, OR TUBULAR MARKERS ARE USED TO CHANNELIZE PEDESTRIANS, LOCATE THEM SUCH THAT THERE ARE NO GAPS BETWEEN THE BASES OF THE DEVICES IN ORDER TO CREATE A CONTINUOUS BOTTOM, AND THE HEIGHT OF EACH INDIVIDUAL DRUM, CONE, OR TUBULAR MARKER IS NO LESS THAN 36 INCHES TO BE DETECTABLE TO USERS OF LONG CANES. WHEN BARRICADES ARE USED TO CHANNELIZE PEDESTRIANS, THE BOTTOM OF THE BOTTOM RAIL WILL BE NO HIGHER THAN 6 INCHES OFF THE GROUND IN ADDITION TO THE ABOVE REQUIREMENTS.
- USE A DIRECTION INDICATOR BARRICADE WITH A ONE-DIRECTION LARGE ARROW (W1-6) SIGN MOUNTED ABOVE A DIAGONAL STRIPED, HORIZONTALLY ALIGNED, RETROREFLECTIVE RAIL.
- USE REFLECTORIZED CONES DURING NIGHTTIME FOR MAXIMUM VISIBILITY.
- PROVIDE RETROREFLECTORIZATION OF CONES THAT ARE 28 TO 36 INCHES IN HEIGHT BY USING A 6 INCH WIDE WHITE BAND LOCATED 3 TO 4 INCHES FROM THE TOP OF THE CONE AND AN ADDITIONAL 4 INCH WIDE WHITE BAND LOCATED APPROXIMATELY 2 INCHES BELOW THE 6 INCH BAND.
- PROVIDE RETROREFLECTORIZATION OF CONES THAT ARE MORE THAN 36 INCHES IN HEIGHT BY USING HORIZONTAL, CIRCUMFERENTIAL, ALTERNATING ORANGE AND WHITE RETROREFLECTIVE STRIPES THAT ARE 4 TO 6 INCHES WIDE. USE A MINIMUM OF TWO ORANGE AND TWO WHITE STRIPES FOR EACH CONE, WITH THE TOP STRIPE BEING ORANGE. DO NOT EXCEED 3 INCHES IN WIDTH FOR ANY NON- RETROREFLECTIVE SPACES BETWEEN THE ORANGE AND WHITE STRIPES
- DO NOT USE CONES DURING NIGHTTIME ON FREEWAYS, DIVIDED HIGHWAYS, OR ROADS WITH A SPEED OF 55 MPH OR GREATER. THIS RESTRICTION DOES NOT APPLY TO PAVEMENT MARKING OPERATIONS.
- DO NOT USE CONES FOR LONG TERM STATIONARY OPERATIONS. CONES WILL BE REMOVED FROM THE ROADWAY AT THE END OF EACH WORKDAY, WITH THE FOLLOWING EXCEPTION:

CONES MAY BE USED FOR UP TO 3 DAYS/2 NIGHTS FOR OPERATIONS WHERE WORKERS ARE CONTINUALLY PRESENT AND WORK IS ACTIVELY UNDERWAY. CONES WILL BE REPLACED WITH VERTICAL PANELS, DRUMS, AND/OR BARRICADES WHEN WORKERS ARE NO LONGER PRESENT, OR WHEN WORK EXTENDS THROUGH ADDITIONAL NIGHTS.

UTAH DEPARTMENT OF TRANSPORTATION

STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

RECOMMENDED FOR APPROVAL

CHAIRMAN STANDARDS COMMITTEE

APPROVED

DEPUTY DIRECTOR

WORK ZONE  
CHANNELIZATION  
DEVICES

STANDARD DRAWING TITLE

REVISIONS

1 04/26/07

JL

TITLE

CHANGED, DRAWING COMPLETELY MODIFIED.

NO.

DATE

APPR.

REMARKS

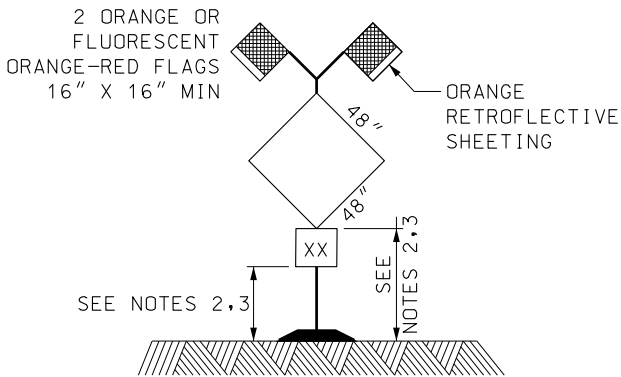
STD DWG  
TC 1A

SUPPLEMENTAL DRAWING

08-MAY-2007 DGN File: L:\Standard Drawings\Imperial\2005\Approved\X-Supplemental Issues\Supp2Approved\TC01B.dgn

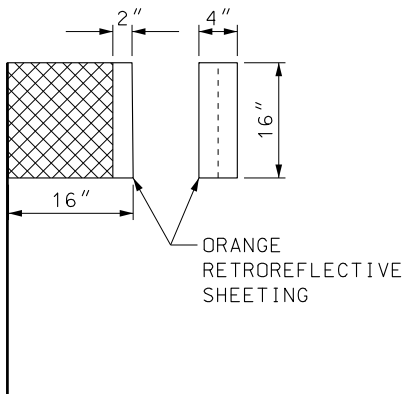


NOTES 1, 6



TYPICAL PORTABLE SIGN SUPPORTS  
INSTALLATION WITH FLAGS

SEE NOTES 4, 5, 6



FLAG DETAIL

SEE NOTE 8

NOTES:

1. CLOSE ROADWAYS WITH TYPE III BARRICADES. EXTEND THE BARRICADES ACROSS INTENDED ROAD CLOSURE A MINIMUM OF  $\frac{3}{4}$  OF THE ROADWAY STARTING FROM THE CENTER OF THE ROADWAY AND EXTENDING IN BOTH DIRECTIONS TOWARD THE SHOULDERS. PLACE A "ROAD CLOSED" SIGN (R11-2) OVER THE CENTER LINE AND THE APPROPRIATE "DETOUR" ARROW SIGNS (M4-10 L OR R) ON EACH SIDE OF THE "ROAD CLOSED" SIGN. DETOUR ARROWS ARE NOT REQUIRED IF DETOUR IS NOT AT ROAD CLOSURE.
2. USE A 12 INCH MINIMUM MOUNTING HEIGHT TO THE BOTTOM OF THE LOWEST SIGN FOR SIGNS ON PORTABLE SUPPORTS.
3. USE A 36 INCH MINIMUM MOUNTING HEIGHT TO THE BOTTOM OF THE LOWEST SIGN FOR SIGNS ON PORTABLE SUPPORTS PLACED AMONG CHANNELIZING DEVICES.
4. USE A MINIMUM 84 INCH MOUNTING HEIGHT FROM ROADWAY SURFACE FOR SIGNS USING POST TYPES P1, P2 OR P3. REFER TO SN SERIES STANDARD DRAWINGS.
5. PLACE TWO ORANGE STRIPS OF RETROREFLECTIVE SHEETING, 4 INCHES x 24 INCHES, VERTICALLY, 12 INCHES FROM THE RIGHT AND LEFT CORNERS ON THE BACK OF SIGNS USED WITH PORTABLE SUPPORTS.
6. USE SANDBAGS WITH SAND OR OTHER COMPARABLE SOFT MATERIAL AS BALLAST. DO NOT PLACE BALLAST HIGHER THAN 12 INCHES ABOVE THE ROADWAY AND DO NOT COVER ANY REFLECTIVE AREA OF RAILS OR SIGNS.
7. SIGNS ON PORTABLE SUPPORTS MAY BE USED FOR 7 DAYS OR LESS. USE PERMANENTLY MOUNTED SIGNS FOR LONGER THAN 7 DAYS UNLESS USE OF PORTABLE SIGN SUPPORTS RECEIVES APPROVAL FROM THE REGION TRAFFIC ENGINEER.
8. USE 4 INCH x 16 INCH ORANGE RETROREFLECTIVE SHEETING SECURELY FASTENED TO THE OUTSIDE EDGE OF THE FLAG. ENSURE TWO INCHES OF THE SHEETING IS VISIBLE FROM EACH SIDE.

SUPPLEMENTAL DRAWING

UTAH DEPARTMENT OF TRANSPORTATION

STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

SALT LAKE COUNTY

RECOMMENDED FOR APPROVAL

CHAIRMAN STANDARD COMMITTEE

APPROVED

DEPUTY DIRECTOR

WORK ZONE SIGNING

STANDARD DRAWING TITLE

STD DWG  
TC 1B

REVISIONS

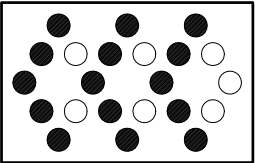
1 04/26/07 JL TITLE CHANGED. DRAWING COMPLETELY MODIFIED.

REMARKS

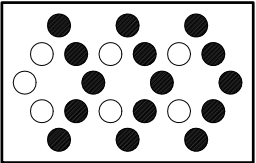
08-MAY-2007 DGN File: LAStandardDrawings\Imperial\2005Approved\X-Supplemental\_Issues\Supp2Approved\TC01C.dgn

ARROW PANELS

CHEVRON ARROW



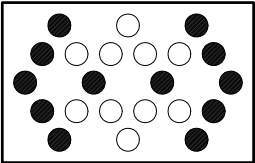
MERGE LEFT



MERGE RIGHT

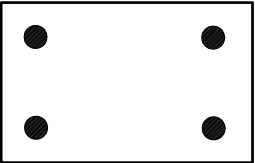
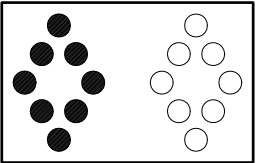
SEE NOTE 3

FLASHING  
DOUBLE ARROW



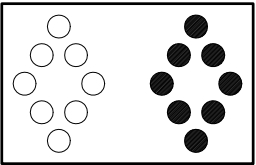
MERGE RIGHT OR LEFT

FLASHING  
CAUTION  
SEE NOTE 2



FOUR - CORNER

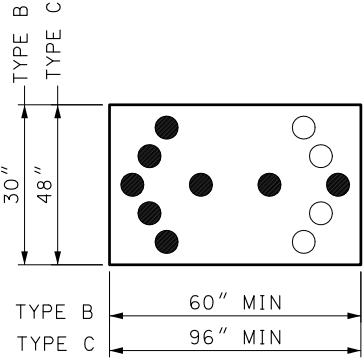
FEDERAL-FUNDED PROJECTS ONLY



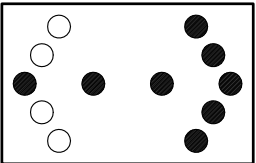
DANCING DIAMONDS

STATE MAINTENANCE AND  
STATE-FUNDED PROJECTS ONLY

FLASHING ARROW  
(OPTIONAL)  
SEE NOTE 4



MERGE LEFT



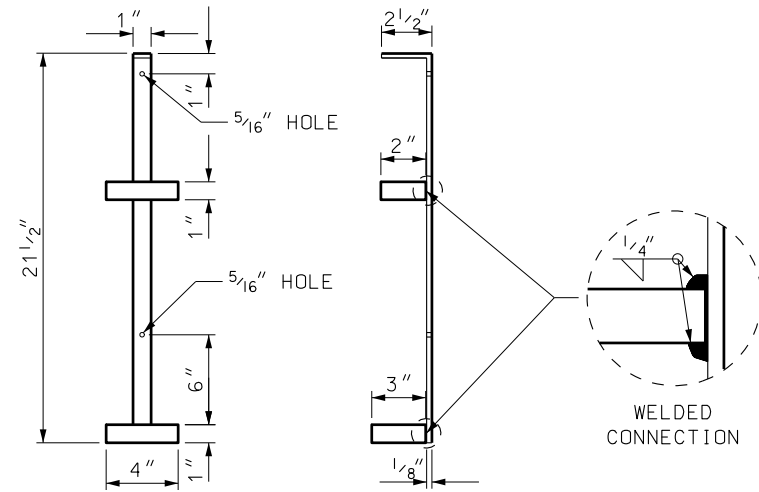
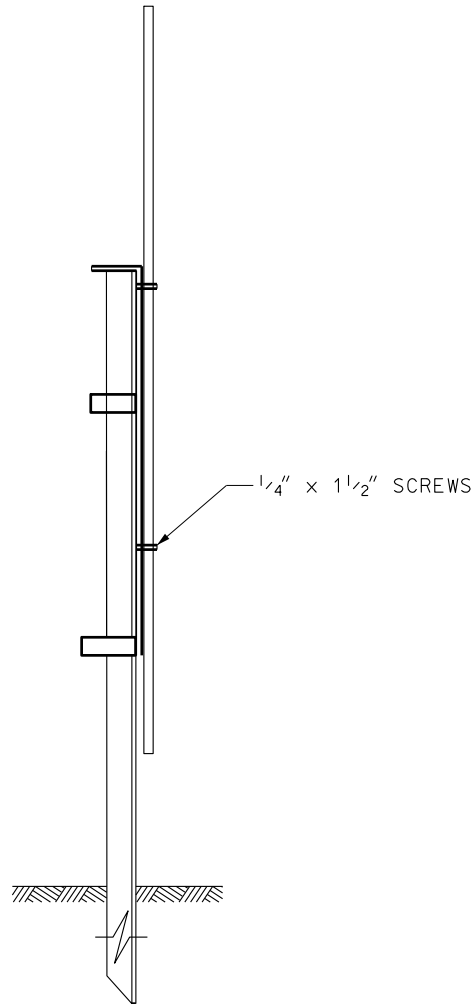
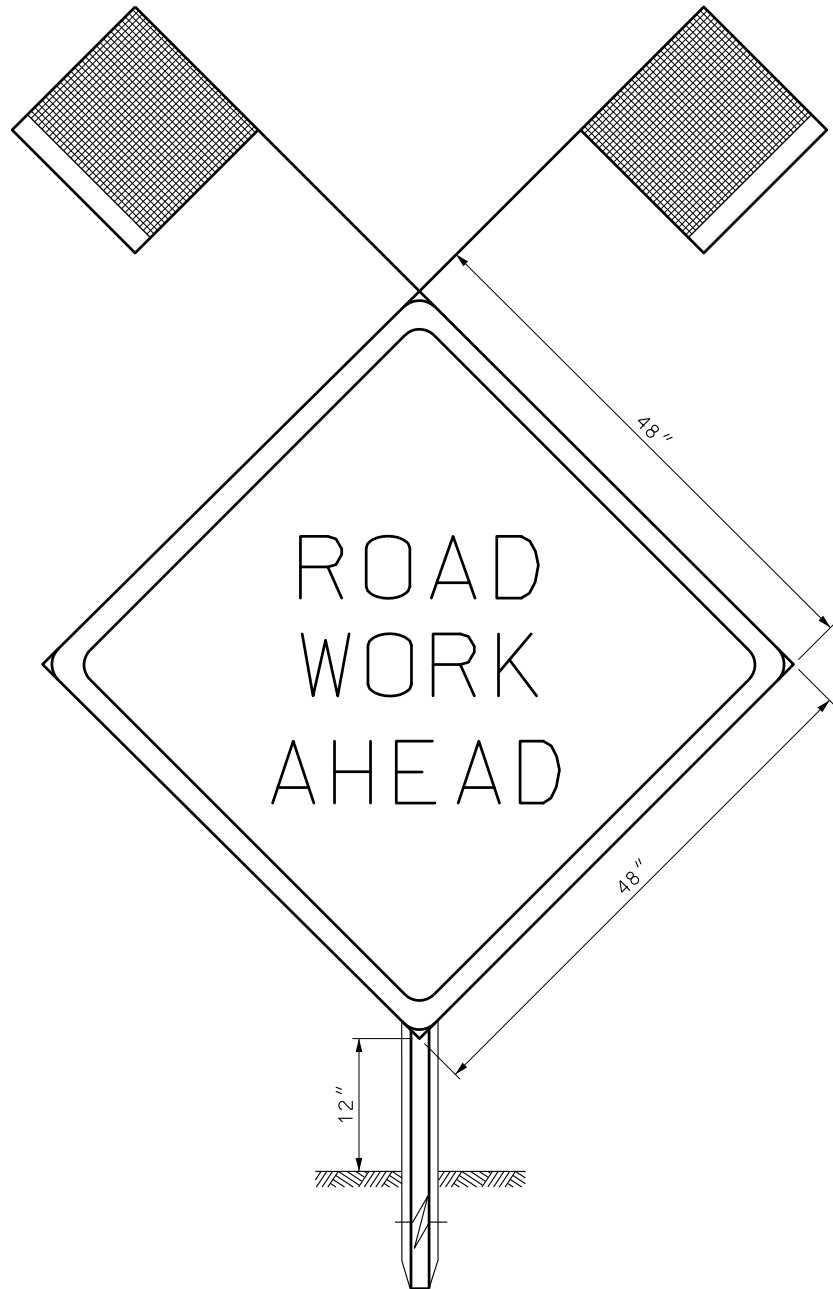
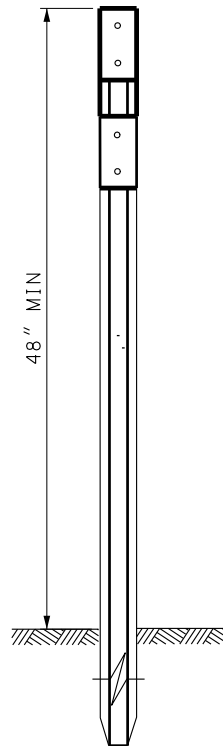
MERGE RIGHT

NOTES:

1. PLACE THE BOTTOM EDGE OF THE ADVANCE WARNING ARROW PANELS A MINIMUM OF 7 FEET ABOVE THE ROADWAY SURFACE.
2. DO NOT USE FLASHING LINE FOR CAUTION MODE.
3. SEQUENTIAL ARROW MAY BE USED.
4. FLASHING ARROW MAY ONLY BE USED ON A 12 ELEMENT DISPLAY.
5. USE SHOULDER TAPER TO DELINEATE ARROW PANEL WHEN ON SHOULDER.
6. TYPE B - 4" DIA SEALED-BEAM ELEMENT  
TYPE C - 5" DIA SEALED-BEAM ELEMENT

UTAH DEPARTMENT OF TRANSPORTATION STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION SALT LAKE COUNTY	REVISIONS	
	1 04/26/07 JL NEW DRAWING.	
RECOMMENDED FOR APPROVAL CHAIRMAN STANDARDS COMMITTEE APPROVED	DATE	APPR.
	APR.26.2007	
DEPUTY DIRECTOR	DATE	REMARKS
	APR.26.2007	
WORK ZONE ADVANCED WARNING ARROW PANELS	STANDARD DRAWING TITLE	
STD DWG TC 1C		

STRAIGHT  
METAL DELINEATOR



MOUNTED SIGN  
BRACKET

NOTES:

1. USE DURING DAYLIGHT PERIOD ONLY.
2. REMOVE BRACKET AND SIGN PRIOR TO NIGHTTIME.
3. USE ON METAL DELINEATOR POST ONLY.
4. USE ASTM A 36 STEEL FOR BRACKET. WELD SQUARE LOOPS ONTO VERTICAL METAL PIECE. PAINT OR GALVANIZE SIGN BRACKET AFTER WELDING IS COMPLETED.
5. USE SCREWS TO ATTACH TRAFFIC CONTROL SIGN TO BRACKET THROUGH THE TWO  $\frac{5}{16}$ " HOLES.

SUPPLEMENTAL DRAWING

UTAH DEPARTMENT OF TRANSPORTATION  
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

DELINEATOR MOUNTED  
WORK ZONE  
SIGN BRACKET

STANDARD DRAWING TITLE

STD DWG  
TC 1D

RECOMMENDED FOR APPROVAL  
SALT LAKE COUNTY  
CHAIRMAN STANDARD COMMITTEE  
APPROVED  
APR. 26, 2007  
DATE  
APR. 26, 2007  
DATE  
DEPUTY DIRECTOR

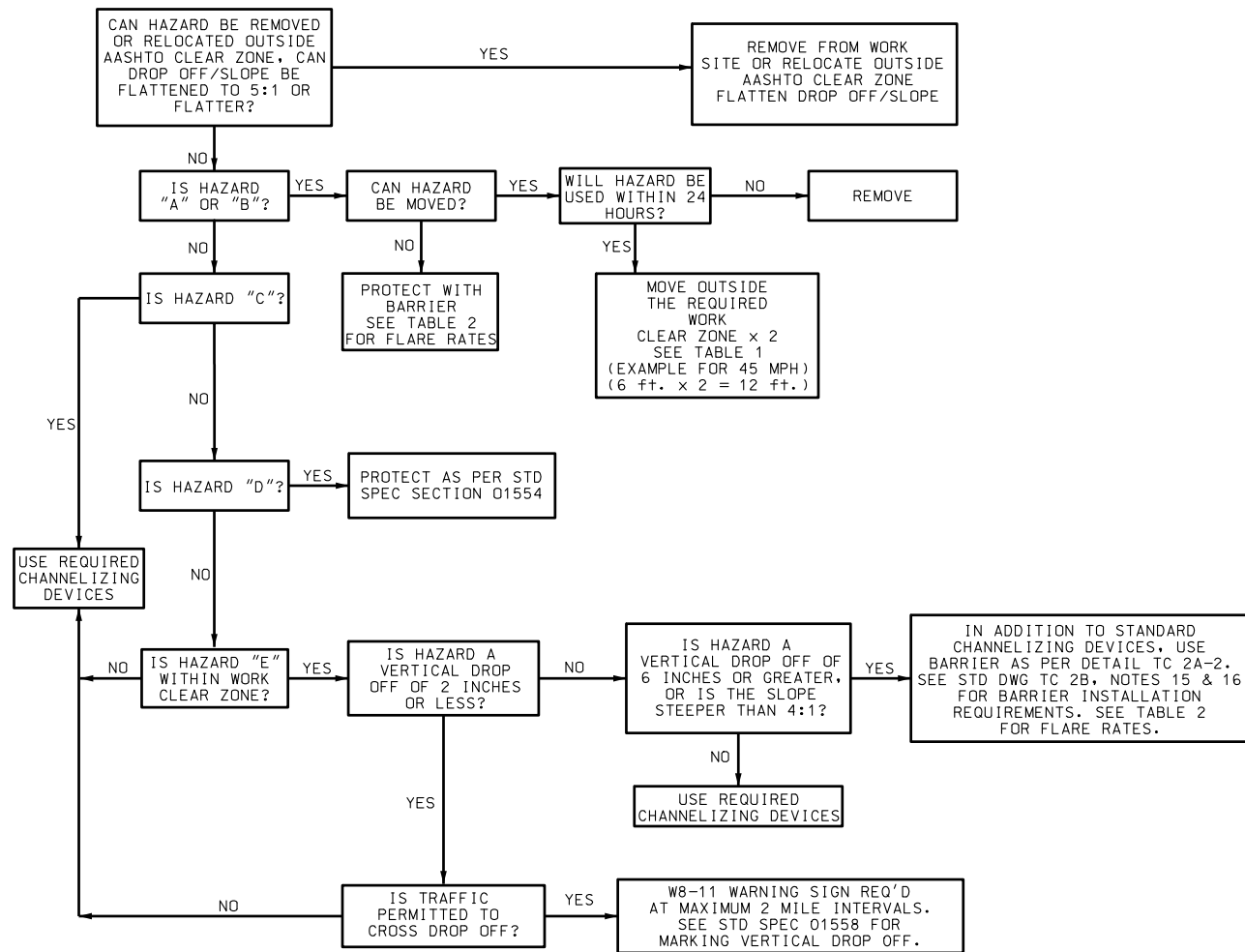
REVISIONS  
1 04/26/07 JL NEW DRAWING.

REMARKS

DGN File: L:\Standard Drawings\Imperial\2005\Approved\X-Supplemental Issues\Supp2Approved\TC2A.dgn 08-MAY-2007

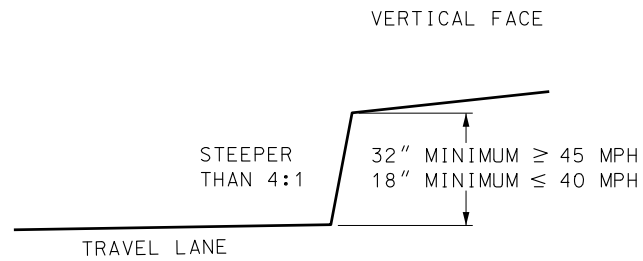
## HAZARD MITIGATION

- USE DETAIL TC 2A-1 AND TABLE 1 (WORK CLEAR ZONE) WHEN MITIGATING THE FOLLOWING HAZARDS:
  - NON-WORKING EQUIPMENT OR VEHICLES
  - STOCKPILED MATERIAL
  - WORKING VEHICLES AND WORKERS (NON-FLAGGERS)
  - OTHER OBJECTS AND FEATURES (I.E.: BRIDGE PARAPETS, BARRIER BLUNT ENDS, POLES)
  - SLOPES STEEPER THAN 4:1 OR A VERTICAL DROP OFF\* OF LESS THAN 48 INCHES (SEE DETAIL TC 2A-2 FOR EXAMPLES)
- MITIGATE ALL OTHER HAZARDS, SLOPES STEEPER THAN 4:1, OR VERTICAL DROP OFFS\* 48 INCHES OR GREATER WITHIN AASHTO CLEAR ZONE AS APPROVED BY THE REGION TRAFFIC ENGINEER.

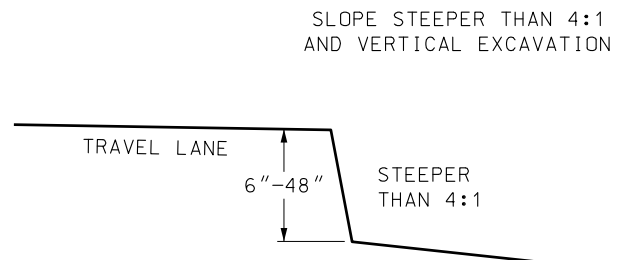


DETAIL TC 2A-1

\* DROP OFF IS A VERTICAL DIFFERENCE THAT MAY BE FROM THE WORK TO THE ROADWAY OR THE ROADWAY TO THE WORK.



BARRIER REQUIRED UNLESS FORESLOPE IS A SMOOTH UNIFORM SURFACE OF SUITABLE MATERIAL TO REMAIN STABLE AND NOT SPALL AT SPEED AND HEIGHT SHOWN



WITHIN WORK CLEAR ZONE USE BARRIER  
OUTSIDE WORK CLEAR ZONE USE DEVICES  
> 48" OBTAIN APPROVAL FROM REGION TRAFFIC ENGINEER

## TYPE "E" VERTICAL DROP OFF HAZARDS DETAIL TC 2A-2

TABLE 1 WORK CLEAR ZONE	
MPH	FEET
40 & LESS	3
45	6
50	6.5
55	7.5
60	8
65	8.5
70	9
75	10.5

TABLE 2 WORK ZONE FLARE RATES TEMPORARY BARRIER	
MPH	FLARE
70	20:1
65	18:1
60	17:1
55	16:1
50	14:1
45	10:1
40	6:1

SUPPLEMENTAL DRAWING

UTAH DEPARTMENT OF TRANSPORTATION  
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

RECOMMENDED FOR APPROVAL  
CHAIRMAN, STANDARD DRAWING COMMITTEE

APR. 26, 2007  
DATE

DEPUTY DIRECTOR

HAZARD  
MITIGATION

STANDARD DRAWING TITLE

STD DWG  
TC 2A



REVISIONS  
1 04/26/07 JL TITLE CHANGED, DRAWING COMPLETELY MODIFIED.

NO. DATE APPR. REMARKS

GENERAL NOTES (APPLIES TO ALL TC SERIES STANDARD DRAWINGS):

1. USE CURRENT EDITION OF UDOT STANDARDS FOR TRAFFIC CONTROL. USE THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR TRAFFIC CONTROL ELEMENTS NOT SHOWN IN THE TC STD DWG SERIES.
2. USE CURRENT EDITION OF STANDARD HIGHWAY SIGNS MANUAL FOR SIZE AND DESIGN OF STANDARD SIGNS.
3. SEE STD DWG TC 1A AND TC 1B FOR WORK ZONE SIGNING AND DEVICE REQUIREMENTS.
4. USE MINIMUM 48" x 48" SIZE FOR DIAMOND WORK ZONE WARNING SIGNS.
5. COVER OR REMOVE NON-APPLICABLE SIGNING, BOTH EXISTING AND WORK ZONE SIGNS.
6. REMOVE NON-APPLICABLE PAVEMENT MARKINGS FOR OPERATIONS LONGER THAN 3 DAYS.
7. REMOVE OR RELOCATE NON-APPLICABLE PORTABLE SIGN SUPPORTS AND SIGNS TWICE THE WORK CLEAR ZONE (WCZ) DISTANCE, SEE SHEET TC 2A, TABLE 1.
8. REFER TO STANDARD SPECIFICATION 01554 FOR FLAGGING REQUIREMENTS AT OPERATING TRAFFIC SIGNALS.
9. USE A FULL LANE CLOSURE WHEN WORK ENCROACHES INTO A TRAVEL LANE.
10. CLEAN AND/OR RESTORE PAVEMENT MARKINGS AT THE END OF EACH DAY'S OPERATION, BOTH ON AND OFF THE PROJECT, THAT ARE OBSCURED BY WORK OPERATIONS.
11. OBTAIN APPROVAL FOR REGULATORY AND ADVISORY SPEED REDUCTIONS THROUGH THE REGION TRAFFIC ENGINEER. USE SPEED REDUCTIONS ONLY DURING IMPACTED TIMES AND AREAS. RESTORE EXISTING REGULATORY SPEED LIMIT PRIOR TO WORK AT LOCATIONS WHERE TRAFFIC IS NOT BEING IMPACTED BY WORK ACTIVITIES. SEE POLICY 06C-61.
12. USE THE POSTED SPEED LIMIT PRIOR TO WORK ZONE TO COMPUTE THE SIGN SPACING, TAPER LENGTH, BUFFER ZONE, AND WORK CLEAR ZONE DISTANCES. USE THE WORK ZONE POSTED SPEED LIMIT TO DETERMINE THE TANGENT SPACING FOR CHANNELIZING DEVICES.
13. USE PLASTIC DRUMS FOR LANE CLOSURE TAPER DEVICES FOR SPEEDS OF 50 MPH AND GREATER.
14. USE A DOWNSTREAM TAPER FOR OPERATIONS LONGER THAN 3 DAYS.
15. PLACE AN ARROW PANEL ON THE SHOULDER OF THE ROADWAY OR, IF PRACTICAL, FURTHER FROM THE TRAVELED LANE. WHEN NO ADEQUATE SHOULDER IS AVAILABLE, PLACE ARROW PANEL IN FIRST 1/3 OF TAPER IN THE CLOSED LANE. IT SHOULD BE DELINEATED WITH RETROREFLECTIVE TEMPORARY TRAFFIC CONTROL (TTC) DEVICES. WHEN AN ARROW PANEL IS NOT BEING USED, IT SHOULD BE REMOVED; IF NOT REMOVED, IT SHOULD BE SHIELDED; OR IF THE PREVIOUS TWO OPTIONS ARE NOT FEASIBLE, IT SHOULD BE DELINEATED WITH RETROREFLECTIVE TTC DEVICES.
16. USE AN APPROVED WORK ZONE ATTENUATOR SYSTEM WITH TEMPORARY PRECAST CONCRETE BARRIER WHEN APPROACH ENDS ARE WITHIN THE AASHTO CLEAR ZONE. APPROVED TRUCK MOUNTED ATTENUATOR SYSTEM MAY BE USED FOR ONLY 24 HOURS OR LESS.
17. USE PROPER LENGTH OF NEED FOR TEMPORARY BARRIER AS PER THE REQUIREMENTS OF THE CURRENT EDITION OF THE ROADSIDE DESIGN GUIDE. USE POSTED SPEED LIMIT PRIOR TO THE WORK ZONE FOR THE DESIGN OF THE REQUIRED LENGTH OF NEED. SEE SHEET TC 2A FOR THE WORK ZONE FLARE RATE REQUIREMENT FOR TEMPORARY BARRIER. APPROVAL FROM THE REGION TRAFFIC ENGINEER IS REQUIRED FOR MODIFICATION TO THE REQUIRED FLARE RATE.
18. USE BUMP SIGN (W8-1) WHEN METAL PLATES ARE PLACED ON THE ROADWAY.
19. USE SUPPLEMENTAL LEFT SIDE SIGNING FOR HIGH-SPEED DIVIDED HIGHWAYS.
20. MAINTAIN PEDESTRIAN TRAFFIC AT EXISTING CROSSWALKS AND ON EXISTING SIDEWALKS. WHEN PEDESTRIAN TRAFFIC CANNOT BE MAINTAINED REROUTE ACCORDING TO STD DWG TC 6.

SUPPLEMENTAL DRAWING

STD DWG	TRAFFIC CONTROL DRAWING SERIES GENERAL NOTES	UTAH DEPARTMENT OF TRANSPORTATION STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION SALT LAKE COUNTY, UTAH	1	04/26/07	JL	NEW DRAWING. REPLACED OLD DRAWING.	REVISIONS
TC 2B	STANDARD DRAWING TITLE	RECOMMENDED FOR APPROVAL  CHAIRMAN, STANDARD DRAWINGS COMMITTEE APPROVED  DEPUTY DIRECTOR					
		APR. 26, 2007 DATE					
		APR. 26, 2007 DATE					
			NO.	DATE	APPR.		REMARKS



TAPER, BUFFER ZONE & SIGN SPACING CHART

ROAD TYPE	POSTED SPEED MPH (S)	MINIMUM TAPER LENGTH(L)	LENGTH OF BUFFER(BZ)	MINIMUM SIGN SPACING (SS)				ONE LANE TWO-WAY FLAGGING
		12' LANE CLOSURE	DESIRABLE	A	B	C	D	TAPER LENGTH
CONVENTIONAL	30 AND LOWER	180	200	100	100	100	100	50
	35	245	250	350	350	350	175	100
	40	320	305					
	45	540	360					
	50	600	425					
	55	660	495					
	60	720	570					
FREEWAY/ EXPRESSWAY	65	780	645	1000	1640	2640	500	
	70	840	730					
	75	900	820					

1- TAPER LENGTH FORMULAS

SPEED	FORMULA
FOR SPEEDS OF 40 MPH AND LESS	$L = \frac{WS^2}{60}$
FOR SPEEDS OF 45 MPH AND GREATER	$L = WS$

WHERE:

L = TAPER LENGTH IN FEET  
W = WIDTH OF OFFSET IN FEET  
S = SPEED IN MPH

1/3 L = FOR SHOULDER TAPER

1/2 L = FOR SHIFTING TAPER

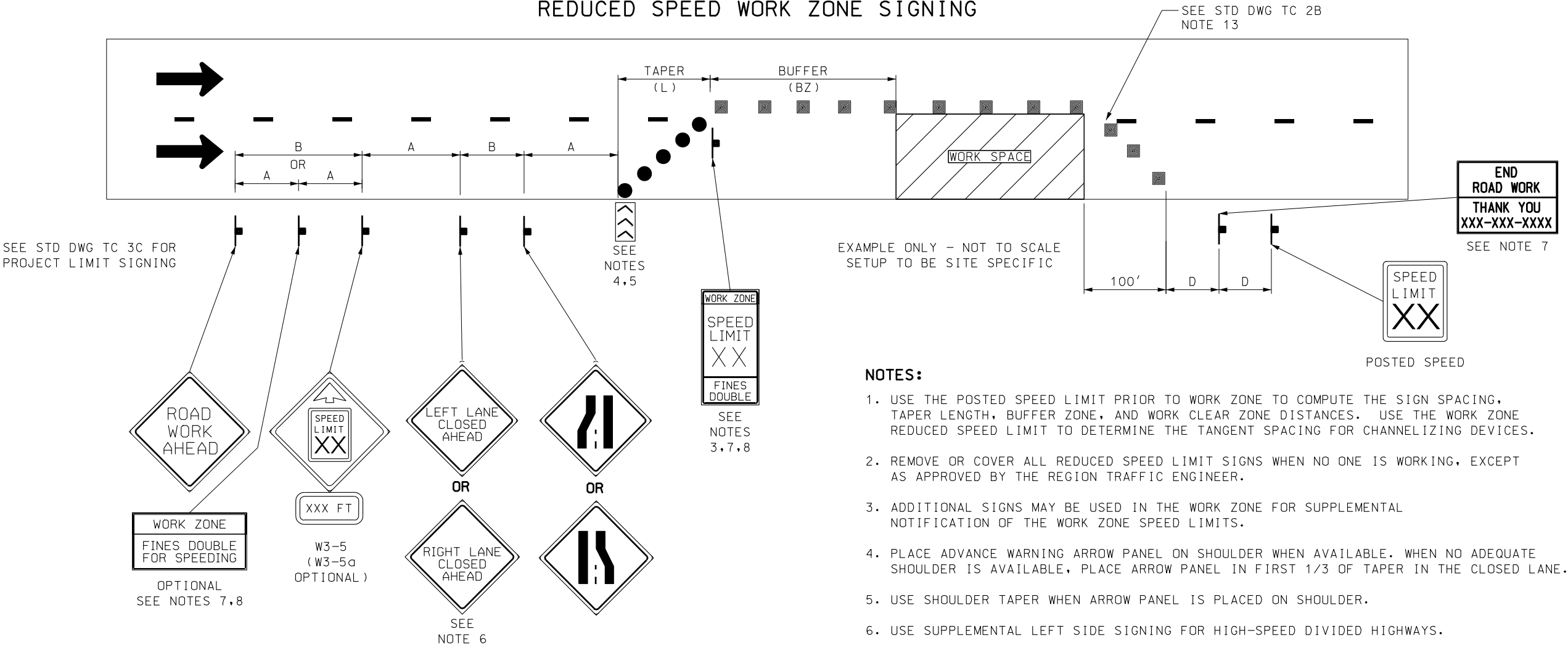
2- CHANNELIZING DEVICES

- A) MERGING AND SHIFTING TAPERS: USE A MINIMUM OF 1 DEVICE PER FOOT OF LANE CLOSURE, PLUS 1 ADDITIONAL DEVICE TO START.
- B) SHOULDER, ONE-LANE TWO-WAY, AND DOWNSTREAM TAPERS: USE A MINIMUM OF 1 DEVICE PER 3 FEET OF WIDTH (OR PORTION THEREOF), PLUS 1 ADDITIONAL DEVICE TO START.
- C) ON TANGENT:  $S \times 2 =$  SPACING UP TO 120 FEET MAXIMUM.
- D) LENGTH OF BUFFER ZONE (BZ) IS THE DISTANCE FROM END OF LANE CLOSURE TAPER TO WORK SPACE, OR ANY OBSTRUCTION PRIOR TO WORK SPACE.

TRAFFIC CONTROL DEVICE LEGEND

- SIGN (FIXED OR PORTABLE)
- CHANNELIZING DEVICE (SEE STD DWG TC 1A)
- PLASTIC DRUMS/DIRECTIONAL INDICATOR BARRICADE
- FLAGGING STATION
- ADVANCE WARNING ARROW PANEL
- BARRIER
- DIRECTION OF TRAFFIC
- TYPE III BARRICADE
- DIRECTION OF WORK VEHICLE

REDUCED SPEED WORK ZONE SIGNING



NOTES:

- USE THE POSTED SPEED LIMIT PRIOR TO WORK ZONE TO COMPUTE THE SIGN SPACING, TAPER LENGTH, BUFFER ZONE, AND WORK CLEAR ZONE DISTANCES. USE THE WORK ZONE REDUCED SPEED LIMIT TO DETERMINE THE TANGENT SPACING FOR CHANNELIZING DEVICES.
- REMOVE OR COVER ALL REDUCED SPEED LIMIT SIGNS WHEN NO ONE IS WORKING, EXCEPT AS APPROVED BY THE REGION TRAFFIC ENGINEER.
- ADDITIONAL SIGNS MAY BE USED IN THE WORK ZONE FOR SUPPLEMENTAL NOTIFICATION OF THE WORK ZONE SPEED LIMITS.
- PLACE ADVANCE WARNING ARROW PANEL ON SHOULDER WHEN AVAILABLE. WHEN NO ADEQUATE SHOULDER IS AVAILABLE, PLACE ARROW PANEL IN FIRST 1/3 OF TAPER IN THE CLOSED LANE.
- USE SHOULDER TAPER WHEN ARROW PANEL IS PLACED ON SHOULDER.
- USE SUPPLEMENTAL LEFT SIDE SIGNING FOR HIGH-SPEED DIVIDED HIGHWAYS.
- SEE STD DWG TC 3D FOR SIGN DESIGN AND LAYOUT.
- USE "FINES DOUBLE" SIGNING AND SPEED LIMIT SIGNING AT ALL MAJOR INTERSECTIONS/INTERCHANGES WITHIN THE PROJECT WHEN REDUCED SPEEDS AND/OR "FINES DOUBLE" OPTION IS USED.

SUPPLEMENTAL DRAWING

UTAH DEPARTMENT OF TRANSPORTATION  
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

RECOMMENDED FOR APPROVAL  
CHAIRMAN STANDARDS COMMITTEE  
APPROVED  
DATE  
APR.26.2007  
DEPUTY DIRECTOR  
DATE  
APR.26.2007

REDUCED SPEED WORK  
ZONE SIGNING  
GENERAL

STD DWG  
TC 3B

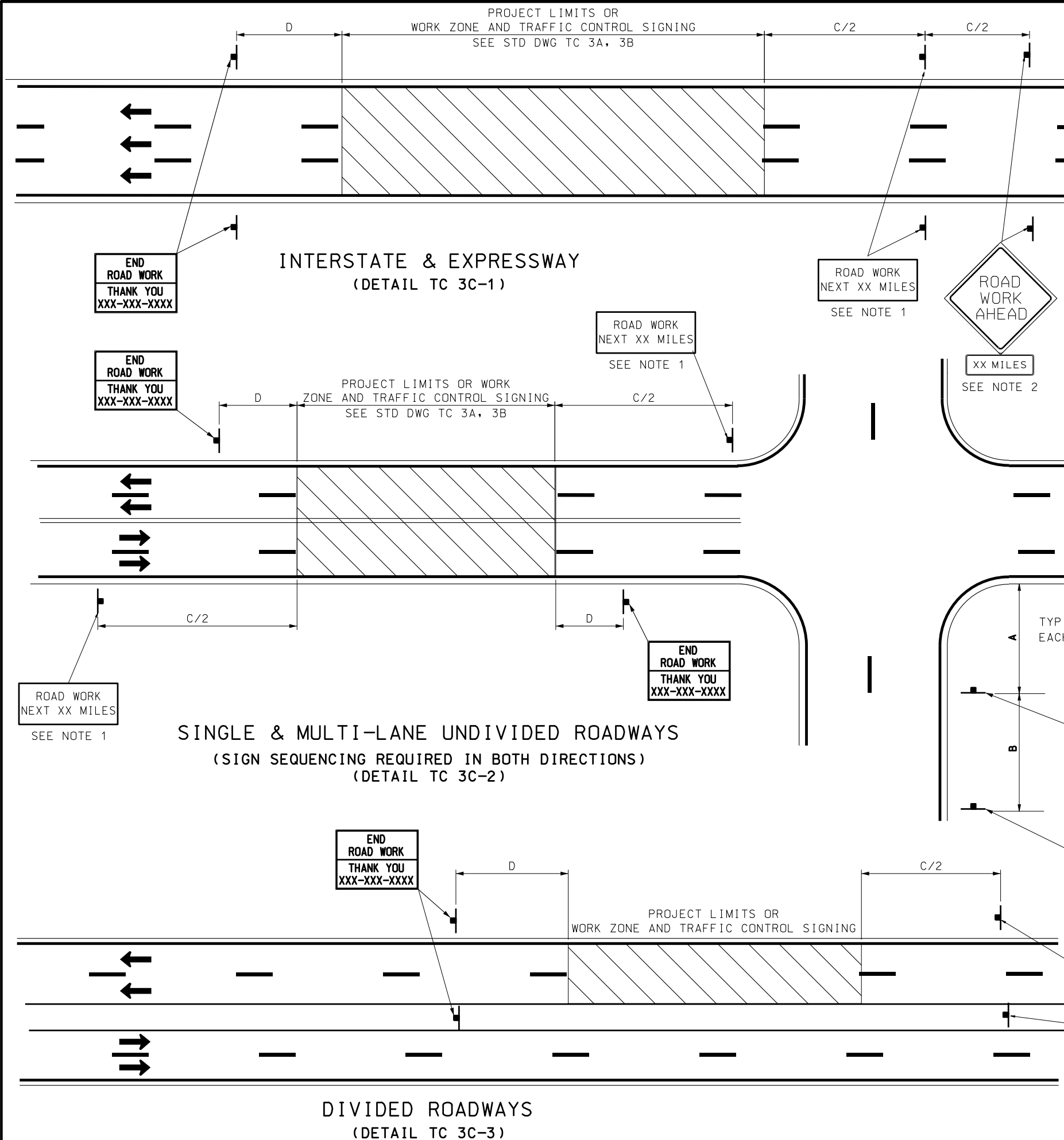
REVISIONS  
1. 04/26/07 JL NEW DRAWING. DETAILS FROM OLD TC 2B.



STANDARD DRAWING TITLE

REMARKS

NO. DATE APPR.





STD DWG TC 3C	TRAFFIC CONTROL PROJECT LIMIT SIGNING	STANDARD DRAWING TITLE	UTAH DEPARTMENT OF TRANSPORTATION STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION SALES AND SERVICE UNIT		1 04/26/07 JUL NEW DRAWING DETAILS FROM OLD TC 3.		REVISONS	
			RECOMMENDED FOR APPROVAL  CHAIRMAN STANDARDS COMMITTEE APPROVED		APR.26.2007 DATE			
			DEPUTY DIRECTOR 		APR.26.2007 DATE			
					NO.		REMARKS	

